COMMODORE user

Incorporating Vic Computing Volume 1 Issue 12 September 1984 UK Price 85p

The computer-controlled home-part 1





Do-it-yourself Forth

Bubble Bus at home

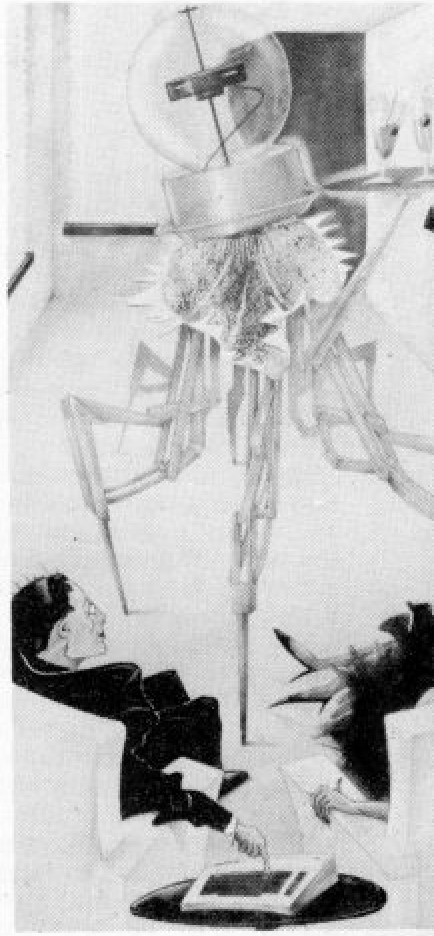
Make music with your 64

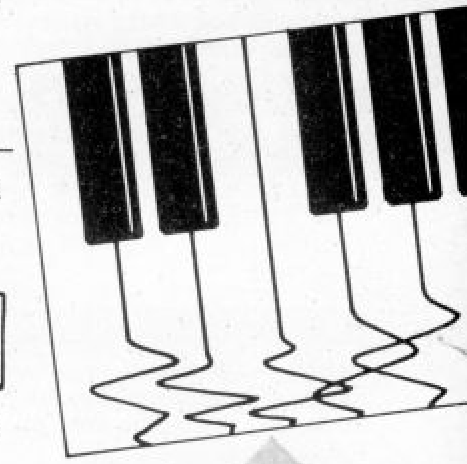
One-liner Competition April and July results

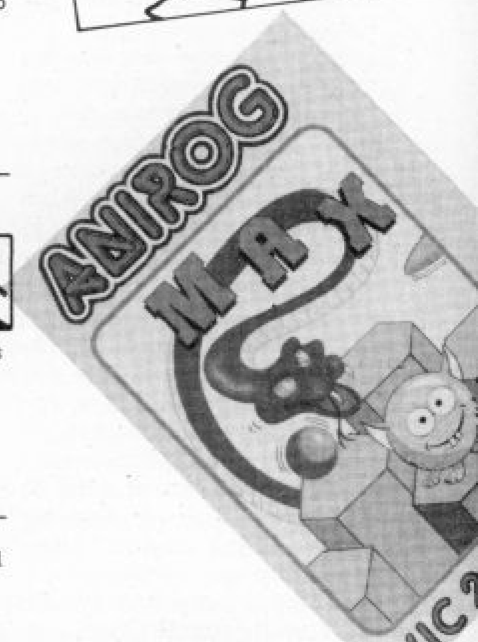
DEALS FOR READERS

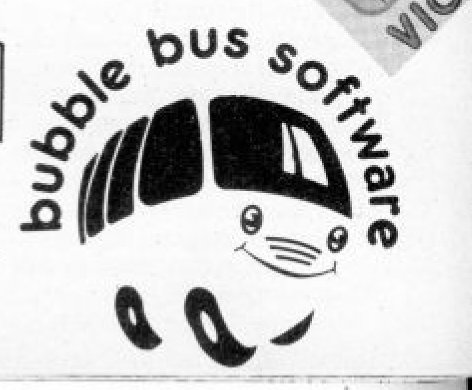
Reviews: Superbase, Home Office

Contents









People

Publisher	Annabel Hunt
Editor	Bohdan Buciak
Special Correspondents	Jim Butterfield Chris Durham Jim Grubbs Tony Harrington Chris Preston Mike Todd
Editorial Assistant	Nicky Chapman
Circulation Manager	Hywel David
Production Manager	Paul Hulme
Art	Maggie Underwood
Production Editor	Mike Pattenden
Advertising	Julia West Roland Richardson
Deals for Readers	Nicky Ned and Vicki Staples

Editorial	01-251 6222
Advertising	01-251 6222
Production	01-251 6222
Administration	01-241 2354

Subscriptions Back Issues
(See last page) 0732-351216

Publisher's guarantee: There are no mistakes in this magazine except this one.

News

Interpod goes cheap

Beginning with the bad news; Oxford Computer Systems, which markets the rather clever Interpod multi-interface device for the Vic and 64, is reportedly suffering severe financial difficulties. That means it will no longer be selling Interpod itself.

But the company is trying to put together a financial package that will enable it to continue selling the Oxford Pascal compiler and other software, including its Turbo 64 driving game.

Now for the good news; Parc Electronics, which actually manufactures Interpod, is now selling it through a company called Cheetah, a marketing outfit it's just acquired. And the price will be £59.95, almost half of Oxford's hefty £99.95 price-tag. Apparently, Oxford had ordered as many as 2,000 of the devices from Parc last March, before its troubles began to appear, hence Parc's desire to move stock quickly.

According to Parc's Laurence Louis, Cheetah will 'continue to support existing owners bu: we can't take over any guarantees issued by Oxford Computer Systems". That's regrettable but probably fair enough. More details on 01 833 4909.

SHORTS

Rabbit on the rocks: *Yet another games software house has fallen on hapless times. This time, it's Rabbit Software, one of the largest producers of games for the Vic and 64, which went into liquidation a few weeks ago. Rabbit's internal troubles started some time ago, culminating in the death, earlier this year, of Alan Savage, its founder. No news yet whether Rabbit's range will continue selling.*

SHORTS

Looking for clues: *In case you're growing somewhat bald trying to solve adventure games from Level 9, here's a little news to smooth your furrowed brow. The company is now providing clue sheets. All you need to do is send a stamped-addressed envelope to Level 9 for complete clues on Adventure Quest, Dungeon Adventure, Lords of Time and Snowball. Why not include clues with the games? "There is too much temptation for the player to cheat and look up the answer to a problem", asserts Pete Austin, the company's adventure designer. If you haven't got a clue, write to: 229 Hughenden Road, High Wycombe, Bucks HP13 5PG.*

Robots on the move



Prism Technology earned the dubious distinction early this year of launching the UK's first domestic robots (see Commodore User, March). But being somewhat pricey, Topo and Fred became less than household names. So Prism has moved down market and it is now offering a range of easy self-assembly robots called Movits, costing between £10 and £35 each.

There are five models; all use batteries and are activated by different types of sensor. Monkey (£9.99) crawls along a piece of string using arms activated by a sound sensor. Piper Mouse (£19.99) also has a sound sensor. But you're provided with a whistle that makes the device trundle in different directions. Then there's Line Tracer (£17.99), which uses an infra red sensor to crawl along a well-defined line. Pretty useful, eh?

More interesting and advanced are Circular (£29.99) and Memocon Crawler (£34.99). Circular rolls around on two large wheels controlled from a remote-control box. Memocon Crawler actually has some memory. It connects to a tiny 5-key keyboard from which you can program movements. Unclip the plug and it's off and away.

According to one Prism spokesman, the company is looking seriously into providing interfaces for the Crawler so that it can be programmed from a Commodore 64 or other popular home micros. That sounds like a good idea but it still won't make the thing do more than crawl around, beep and flash its lights. Sounds rather like a traffic jam. More details on 01 253 2277.

Return of Tramiel

One-time Manahattan taxi driver and typewriter repair expert Jack Tramiel is back in the news. Avid Commodore-watchers will know him better as the recently departed founder and chief executive of Commodore International.

Tramiel left Commodore in the Spring, sparking off an exodus of top executives who were later reunited with their leader in Tramiel Technologies, the company he set up immediately on departure.

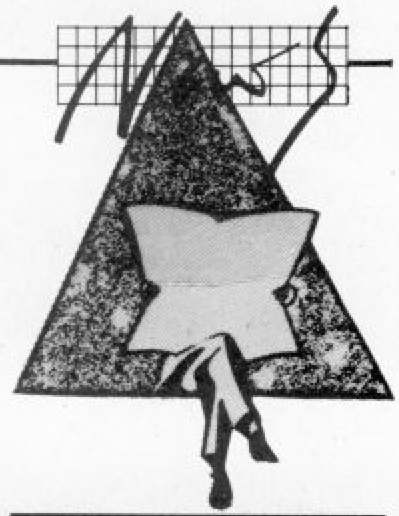
But with his knack of being totally unpredictable, he's managed to surprise 'industry observers', and Commodore itself, by announcing that he's bought Warner's ailing Atari division. Apparently, Commodore itself had figured in the bidding unaware that its former leading light was limbering up for combat.

Atari has had both a meteoric rise and an equally spectacular decline, which has enabled Tramiel to buy the company at bargain-basement rates, reportedly by merely taking over its rather larger debt.

With the deal comes Atari's not insubstantial manufacturing facilities. So it's not surprising that speculation is rife that Tramiel intends to make an onslaught on the low-cost computer market – exactly the market Commodore has carved almost exclusively for itself in America.

According to Commodore bigwig, Gail Wellington, the news has surprised but not shaken Commodore: "we knew he was coming back but his buying up Atari has totally surprised us. The effect will be felt more in the States, though. We're virtually running a one horse race there in the low-cost computer market. So we reckon the competition will be good for us." If Commodore is force-feeding sour grapes, it's certainly trying not to show it.

Try as it will, though, news has broke that Commodore International is sueing four of its former staff who left with Tramiel, for alleged theft of secret material referring to Commodore's Z8000 chip project planned for next year. A court in Pennsylvania granted Commodore a temporary injunction around the beginning of July. So it looks like a case of adding bitter lemons to those aforementioned grapes.





Count of Mantissa: take in a little more on the shoulder?

Pop goes Hercules

The software business must have a magnetic attraction for some members of the record industry. All set to join the likes of Virgin and K-tel is Interdisk, a software house financed by Island Records.

According to Interdisc's minimally modest blurb, Carol Wilson, its director has already acquired legendary status "by discovering and signing a number of megastars, including Sting, Human League, Orchestral Manouevres..."

These probably pale into insignificance when matched with her latest discovery: the author of *Hercules*, Interdisc's first game for the Commodore 64. Called the Count of Mantissa, we're informed that "his present incarnation is not his first" (that rings true of a few pop stars), and that "he was one of Socrates' closest friends". Does this mean Socrates will be writing Interdisk's next game?

Still, the game might be a little better than the marketing hype. It's available on tape, costs £6.95 and features what Interdisc calls a Random Access Principle: on losing a life you're plunged randomly into one of the game's fifty frames. We've given a copy to one of our Herculean reviewers for a random review.

GOSH is back

Avid readers with long memories will remember our mention of the Guild of Software Houses last October, which was set up to combat software piracy and bring the miscreants to justice. Well, the pirates are still afloat and GOSH, although it reckons to have seized about 10,000 tapes, still hasn't achieved a major coup.

According to chairman Nick Alexander of Virgin Games, GOSH has had problems: "when you take legal action, you leave yourself open to counter suit if action is unsuccessful. So if you're not a limited company, the officers of the Guild become personally liable for any damages against GOSH".

So GOSH has formed itself into a limited company to ensure its members won't personally be forking out for damages. And with its increased membership (it now stands at 38 software houses), it professes to be all set for renewed action.

"You can expect legal action soon," asserts Alexander, whose mien unfortunately does little to suggest toughness. "We're not concerned about the likes of little Johnny. We're looking for the professional counterfeiter. This is organised crime. It's no use getting the guy who supplies the dealer; you have to follow the chain."

Strong words, but at least GOSH did have some examples of copied tapes to show at its recent press conference. One of them, ironically, was a remarkably accurate copy of an Imagine game, the company that's just gone bust. With copying of that standard, GOSH will have its work cut out.

So how much power does GOSH have? Alexander again: "We're levying a £500 annual membership fee which will enable us to employ a permanent secretary and establish a permanent office. We also have a fighting fund, a separate levy which varies on the software house's turnover." That fee is collected confidentially so that members don't find out how much money each of them are making – they're competitors, after all. The fund now stands at a moderately healthy £50,000. We wait with baited breath...

SHORTS

Magic Roundabout: *Fans of Zebedee and Dougal and Florence and Dillon will be pleased to hear that Computer Rentals, a London-based software house has acquired the rights to produce a game based on the Magic Roundabout and its now legendary characters. The game should be available on the Commodore 64 by the end of the year. Like most software houses, CRL is going for the Spectrum market first. No details of the game's theme yet, though. Hopefully, it won't be 'time for bed' when you've finished playing.*

SHORTS

Granada invasion: *Television rental companies used to rent just televisions. Then they took the logical step of renting video recorders and video tapes. Now Granada TV Rentals, one of the biggest box-renters in the UK (it's just bought up Rediffusion) has started selling home computers, including the Vic and 64 in its 100 High Street showrooms. It's also offering a range of software and peripherals. Prices look to be pretty standard with the rest of the High Street brigade. But will you be able to rent a computer? Well, no.*

SHORTS

Scope for members: *Users of ISP Marketing's Scope games design package may be pleased to hear that the company has started a Scope Users Club which will run a quarterly newsletter and provide a telephone hot-line service to give technical advice. Membership is free to all existing Scope owners. You actually get a dinky little plastic card with the hot-line number boldly displayed with the words "strictly confidential..." But to use the service, you must quote your membership number. The idea seems to be catching on; ISP reports that membership already exceeds 2,000. More details on 0256 79 6559.*

TOTL for Vic

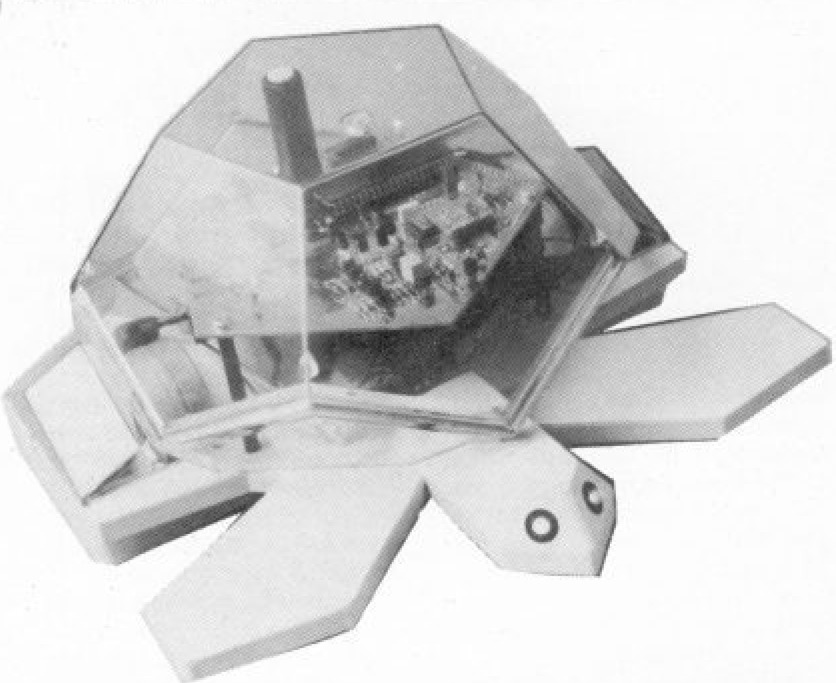
Vic-20 owners who were disappointed to read in our July issue that Thorn EMI is distributing only Commodore 64 versions of American TOTL Software's range of word processing packages, will be pleased that Atlantic Software in Kingston has been selling the Vic range for some time in the UK.

It has two versions of TOTL.TEXT: 2.0 and 2.5. The former is for the Vic with 8K expansion. It offers full formatting control over line width, page length, margins, tabs, justification and spacing. Text output, editing and insertion are carried out in single mode. You get full cursor control and backward and forward scrolling. For that lot, you'll pay £13.95 for the cassette, or £14.95 for the disk version.

A little more expensive is Text 2.5 which requires 16K expansion and costs £18.95 on tape and £19.95 on disk. It has a few more advanced features like shorthand format commands, embedded footnotes, headings and footings, and printing direct from tape or disk files. Using TOTL.Label (£11.95 on tape and £12.95 on disk), the package will merge labels from the address files created.

Both versions of Text support Commodore graphics, and can be used with Commodore printers as well as Centronics and RS-232 printers linked with a suitable interface. More details from Atlantic Software, 18b Thorpe Road, Kingston, Surrey KT2 5EU.

Turtle soup



The House of Commons is not noted for its lightning speed of action so it's probably fitting that Valiant Designs should use it as a venue for launching its new roving mechanical quadruped – a Turtle. That hi-tech reptile is now available for the Commodore 64 and most other leading home computers, for the very reasonable sum of £150.

Turtle technology has been around for some time. But for the uninitiated, it's a robotic device used mostly in conjunction with Logo, a high-level programming language supposedly easier to learn than Basic for young children. Commands generated with Logo activate the turtle's sensors, driving it in various directions. Whether that leaves you excited or not, Valiant's press blurb enthuses that it is "the most revolutionary step yet in teaching children computer technology".

So the message from Valiant is that Turtles are good for kids. David Mellor, MP for Putney (he was there because Valiant lives in his constituency) pontificated, "it's going to help a lot of kids to get into computers". Next came Technology Minister Kenneth Baker (he dropped in before going to lunch) who was, "delighted to help in the development of this product". By which he means the government threw a few grants in Valiant's way.

Valiant's directors are noted for the number of letters after their names. But Tom Stonier, the man with the largest total (eleven letters) and a professor at that, got to make the speech. He perceived "an increasing shift to the home as a centre for education" (turtles roaming your living room?), and opined that "we must put the fun back into education". One funny thing about Valiant's turtle is that its eyes light up.

No strings

The device certainly does look like a turtle – more than can be said for previous offerings. And it's also pretty advanced; it's the first device to be remote controlled. So there are no restrictive wires to get in the way (including a mains lead as it runs off rechargable batteries). Its infra red transmitter plugs into the 64's user port. And that controls the turtle's movements and its internal pen which can be lifted or lowered for drawing.

The turtle comes complete with manuals and disk or tape-based graphics software. A turtle icon actually appears on the screen which mimicks the movements of the physical device. That package gives you only a limited range of commands, so to get more from your machine you'll have to buy one of the implementations of Logo now available. Valiant provides interface programs to enable you to run any of the popular versions.

The turtle was actually displayed running Commodore's own version of Logo, which costs £34.95 and for which you'll need a disk drive. Since quite a few Commodore people were hovering on the periphery, chances are that this may become the most popular implementation.

Commodore is making a strong push into the schools market so the combination of Valiant's turtle and Commodore's Logo would seem especially attractive – but nobody was saying much. More details on 01 720 3947.

Wafadrive alive

For those of you who've sought in vain for an alternative to the sluggish and expensive Commodore 1541 disk drive, the new Rotronics Wafadrive may be a glimmer of light.

Appearing in September, it will cost around £150 and will be available for the Vic, 64 and the new 16 and Plus 4 machines. The device is designed and manufactured in the Far East by BSR, of record turntable and the now quiescent Aquarius home-computer fame.

So what's a Wafadrive? Well, it's a variation on the Sinclair microdrive theme. That means it doesn't use floppy disks like the 1541 but cartridges which carry an infinite loop of tape wound on a single spool (Rotronics call them 'wafers') which travel at much faster speeds than the humble cassette.

The Wafadrive contains two drive units and uses wafers of 16K, 64K and 128K capacities (they're pretty cheap at around £3-£4 each). So you've got a maximum of 256K storage at any one time, compared with a lowly 51K for a 1521 floppy disk.

But the capacity (governed by tape-length) of the wafer determines the access time: that's the average time it takes to get at any one program or piece of data. Since floppy disk drives have random access, that time should be pretty quick. And since tapes work on a linear basis, they should be comparatively slow.

As it happens, Graham Booth, Rotronics' technical boffin claims that the average access time for both devices are pretty similar, at around six seconds: "the Wafadrive is a little faster using the 16K wafers," he asserts. "But there's a trade-off involved. The 128K wafers give access within 47 seconds." That's slow on speed but comparitively high on data storage.

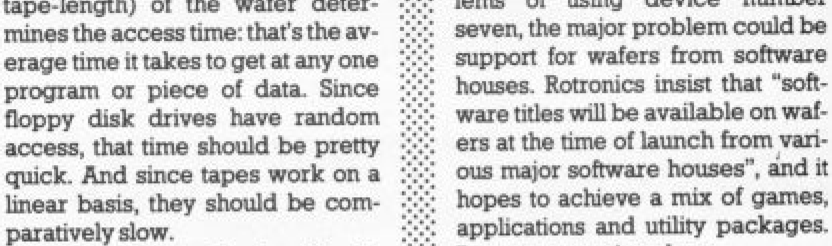
Like the 1541, Wafadrive connects through the Commodore serial port, but it's designated as device number seven. And Rotronics claims it "behaves in an almost identical way to the 1541 disk drive", and that "it can daisy-chain with other Commodore peripherals in the normal manner".

On the goodies side, it has built-in RS-232 and Centronics interfaces. There's an internal processor and some RAM (we don't know how much yet) which gives the machine some 'spooling' capability. That means it can output to a printer, for example, whilst the computer is performing another task.

Another likely goody is its 'predictive loading' facility. What that means is, using a machine-code routine you can tell the drive to stop at whatever block you next require. That should speed access time up a little.

Apart from the potential problems of using device number seven, the major problem could be support for wafers from software houses. Rotronics insist that "software titles will be available on wafers at the time of launch from various major software houses", and it hopes to achieve a mix of games, applications and utility packages. But we must wait and see.

A Wafadrive should be winging its way to us shortly for dissection from a reviewer. Meanwhile, more details from Rotronics on 0494 452757.



The Commodore version of Wafadrive is colour-coordinated and has a built-in power supply.


RoomLord
NEW
from PARAMOUNT
Retain the inheritance of Roomlord against Demons, Cyclops, Chinese Dragons, Gangsters and many others. 16 full playing screens will elevate you to Super Roomlord.
Written by Jason Benham
Available Now for COMMODORE 64 with Fast Load
COUNTDOWN
VIC 20 – 8 or 16K
"Like all the best games, will both infuriate and thrill you." (10 out of 10) Popular Computing Weekly.
"An enjoyable and maddeningly addictive game." Personal Computer News.
OUTBACK
COMMODORE 64 and any VIC 20
Deserves to be a best seller. "Oodles of programs for your money." Commodore User.
"Super graphics, excellent sound and a great sense of humour (5 stars). Home Computing Weekly.
CHOCABLOC
VIC 20 – 8 or 16K
"A very challenging opponent ... well done Paramount." "Should appeal to all devotees of arcade games." Commodore User.
MEGAWARZ
COMMODORE 64
"Exciting and addictive" "Get it" (5 stars) Home Computing Weekly.
"A cultured sophisticated space game." "Quite excellent" Commodore User.
Selected Titles available at
Boots
John Menzies
Retailers contact your usual distributor.
Export and distribution enquiry to Marketing Director
PARAMOUNT 67 Bishopton Lane, Stockton Cleveland TS18 1PU (0642) 604470
Post to:– Paramount Software, 67 Bishopton Lane, Stockton, Cleveland TS18 1PU
Roomlord £6.95 ( ) Name......
Megawarz £7.50 ( ) Address......
Outback 64 £7.50 ( ) ......
Chocabloc £6.50 ( ) ......
Countdown £5.50 ( )
Outback £5.50 ( )
I enclose cash/cheque/PO for £
· Overseas orders add £0.50 per item

Control your home with your Vic or 64

Part One of a series

by Chris Durham

This month we start a new series, on analogue to digital conversion, and vice versa. Or, to put it more succinctly, on using your Vic or 64 to run things. And, to be absolutely precise, on controlling your home (or bits of it) from your computer.

We dragged Chris Durham away from his word processor review marathon and set him to work to interface his 64 (and the Vic) to the big bad world: and over the next few months he'll be showing you how you can build, or buy, a system to control anything from a fan-heater to a robot.

And now for something completely different, as they say. Many readers will by now have read many reviews on games, business software, utility packages and the like; and many of you will have used many of the same themselves. After you've written your umpteenth letter and shot down your billionth Invader, though, you may be wondering whether there isn't something more you can be using your machine for.

Well, for those of you who hanker to Control the World, here's your starter for ten. During the next few months the series will cover control of mains devices (lamps, heaters and the like), low-voltage control for relays and solenoids, and how to input signals to the computer from switches, bells and various forms of sensor like water alarms and central heating thermostats etc.

Full circuit diagrams will be given plus printed circuit board (PCB) designs for anyone handy with a soldering iron. For those who don't have the facilities to make their own boards we will also be covering commercially available products; something for everyone, in fact.

The point of it all

At this point some cynics may well be asking why anyone would want to use their computer to turn a light on and off; switches after all, are readily available and much cheaper!

Well, apart from the fact that it's fun to see what you can do with your machine, it is *the interaction between the computer and the environment around it* that is being practised. Switching a light on and off is a simple way of demonstrating the techniques; once learned, these can be applied in more sensible applications. Like they could theoretically be used to control a nuclear power station with a Vic-20 (although I'd rather not be around when someone tries). To give a more practical example: by the end of this series you could have a system which detects the opening of the front door, turns on the lights, switches the kettle on and starts the hi-fi, *providing* it's between 4.30 and 5pm Monday to Friday. Try doing *that* with a simple switch.

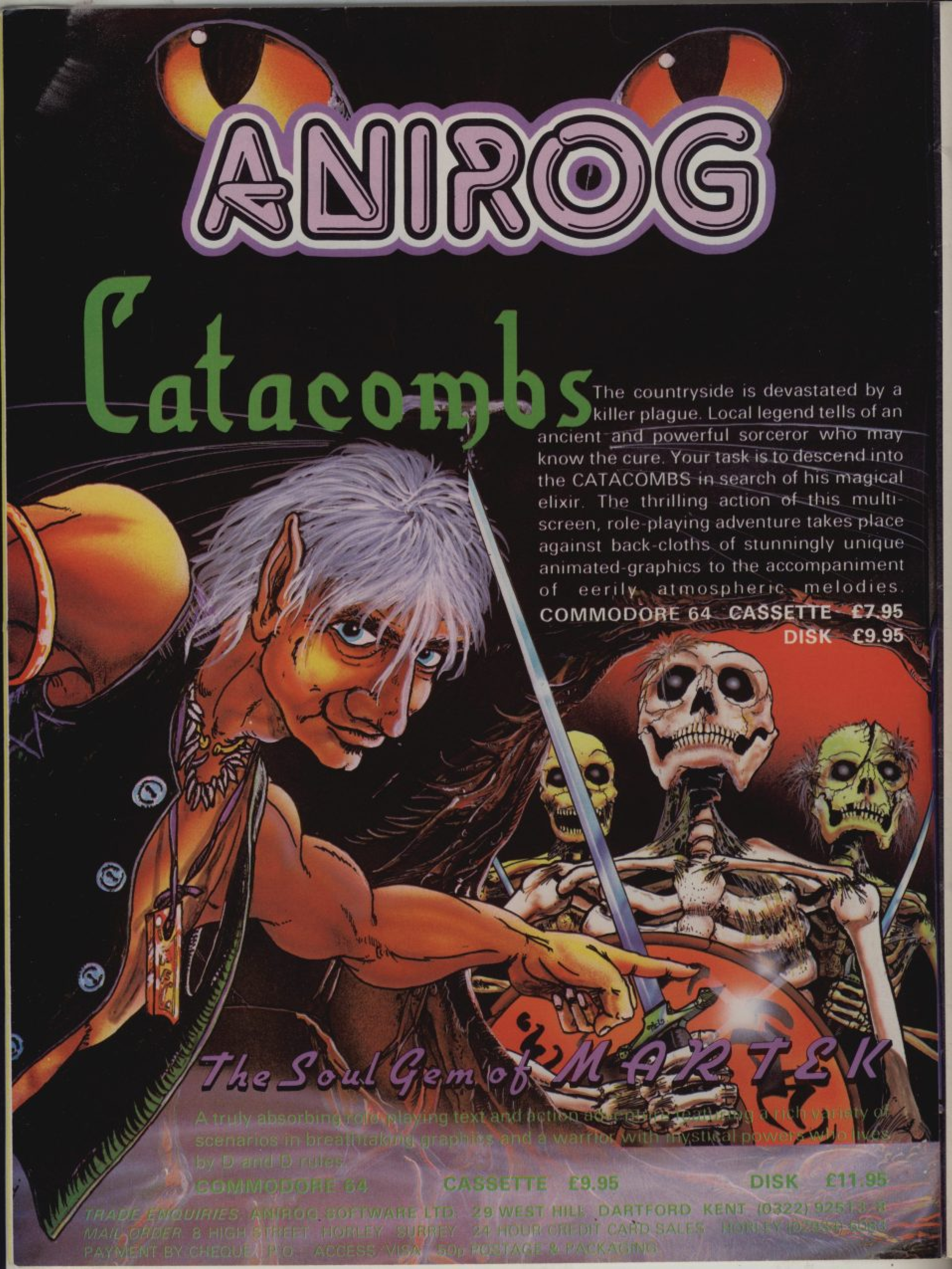


Before you start getting too carried away with thoughts of a computer-controlled Utopia, though, let me run through a few drawbacks of such a system. First of all, the computer must be switched on all the time – otherwise you'll have to reset the time/date part of the program every time you start it up (unless you have an additional battery-powered clock module). And in case the horrible realisation hasn't struck you yet, you can't play *Space Invaders* while the computer's doing its control tasks. Bit of a drag, no?

Actually the latter comment is only partly true. I hope to show you how to use the computer for other things even as it is controlling things, though you will have to delve into machine code to do it; more of this later on in the series.

Only connect

In order to be able to influence events in the outside world we



ANIROG
Catacombs
The countryside is devastated by a killer plague. Local legend tells of an ancient and powerful sorceror who may know the cure. Your task is to descend into the CATACOMBS in search of his magical elixir. The thrilling action of this multi-screen, role-playing adventure takes place against back-cloths of stunningly unique animated-graphics to the accompaniment of eerily atmospheric melodies.
COMMODORE 64 CASSETTE £7.95
DISK £9.95
The Soul Gem of MARTEK
A truly absorbing role-playing text and action adventure featuring a rich variety of scenarios in breathtaking graphics and a warrior with mystical powers who lives by D and D rules.
COMMODORE 64 CASSETTE £9.95 DISK £11.95
TRADE ENQUIRIES: ANIROG SOFTWARE LTD. 29 WEST HILL DARTFORD KENT (0322) 92513/8
MAIL ORDER: 8 HIGH STREET HORLEY SURREY 24 HOUR CREDIT CARD SALES HORLEY
PAYMENT BY CHEQUE P.O. ACCESS VISA 50p POSTAGE & PACKAGING



must have some form of connection between our computer and the devices to be controlled.

Unfortunately, most electrical devices in the home that you might want to drive work either on mains voltages or from batteries of the 3, 6, 9 or 12v DC type with currents ranging from a few hundred milliamps (mA) up to 10 amps or more.

None of these can be driven *directly* from a computer that runs on 9v AC and 5v DC with a maximum current rating of only 100mA. What we need is an 'interface' which will allow the voltage/low current signals from the computer to control those very different voltages and current levels effectively – and safely.

A black box like that can be connected to the User Port of the computer; that allows us to access certain locations (or registers) within the memory, and this port also provides the power supplies needed by the interface. **Diagram 1** shows how the basic system will work – other methods of control that will be mentioned are merely variations on this theme.

The Mains Control Unit

The first thing we must do is build the interfaces that make the system work. There are a number of ways of using low voltages (meaning 6 to 12v) to control higher voltages. The most common is via a *relay*, where a low voltage applied to a coil closes contacts which can carry both high voltage and current.

This approach suffers from the disadvantage that the coil itself needs a sizeable current (70-90mA) to operate it. Since the computer can only supply a maximum of 100mA from the User Port, this presents a problem if you want to control more than one device simultaneously.

There is, however, another device which will switch mains voltages – and which only requires 10mA at 5v; an 'opto-isolated triac'. Even this is not ideal on its own, being limited to about 1.4 amps on the mains side (enough only for a small lamp). But triacs can be connected in series to allow any size current up to 25 amps to be switched.

The solution: the circuit for this is shown in **diagram 2** and is the one we're going to use for our mains control system. We will start with this basic unit and build up our system as we go on.

In order to make the most efficient use of our system, but at the same time cut down on the actual building, I have combined two of these circuits in each control box – enabling two devices to be controlled *independently* from one normal mains socket. You can of course build as many, or as few, of these control circuits as you wish in each box. The board layout for the twin unit is shown in **Diagram 3**.

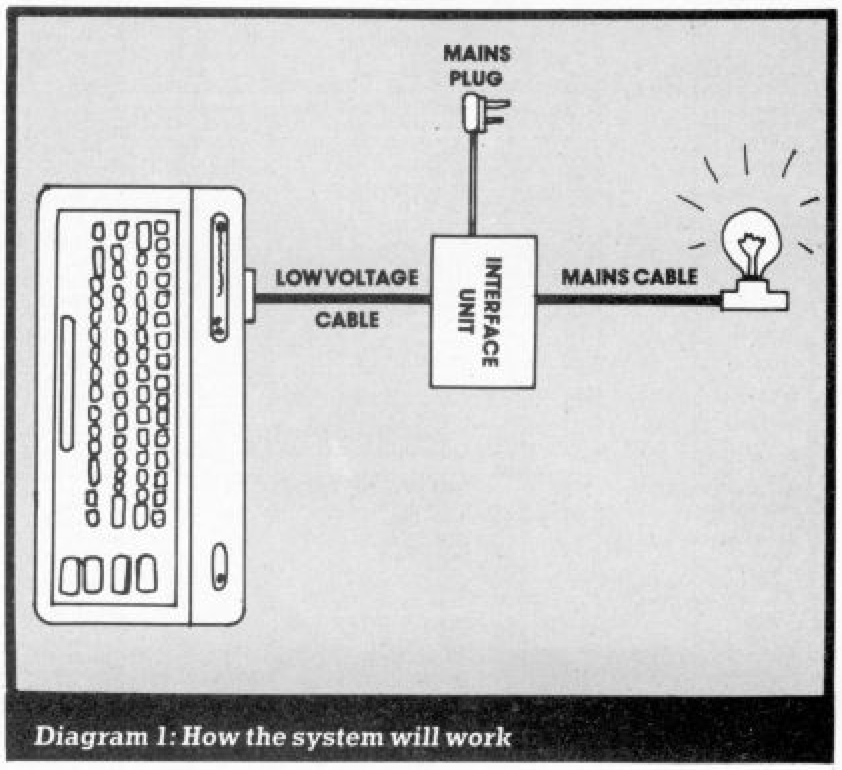


Diagram 1: How the system will work

Constructional details

The first thing to note is that we are going to be working with mains electricity. Whilst this is not dangerous if it's done properly, there are certain precautions that must be taken:

- **NEVER** work on any device that is plugged into the mains – always remove the plug first
- **ALWAYS** check the wiring and construction thoroughly before plugging it in for the first time
- **ALWAYS** ensure that the plug is correctly fused and never attempt to exceed the 13 amp rating of the unit.

The golden rule is that unless you are completely confident about what you are doing, get someone more experienced to help you.

The construction is very straightforward and uses readily available components. First, the Veroboard must be cut to the size shown (this is exactly half a standard 127x63 mm board).

Next, cut the copper strips in the position shown in **Diagram 3**. Now mark and drill the holes for the mounting points and the heat sink (the actual size will depend on your method of mounting – most pcb supports require a 4mm hole).

Note that the heat sink will be slightly offset when fitted and it will be necessary to drill an extra hole to allow both triacs to be mounted on it (the heat sink is needed to maintain a current rating of the triacs; without it their current-carrying capacity is reduced by over half).

When soldering the components, it is best to do so in the following order:

wire links
resistors
triacs
connecting wires
opto-isolators

Those opto-isolators can be mounted in a DIN socket if required, as shown in **Diagram 3**; in that case mount the sockets after the wire links, fitting the opto-isolators once all the soldering is complete. Ensure you observe the 'polarity' of the devices; the 'dot' indicates pin 1.

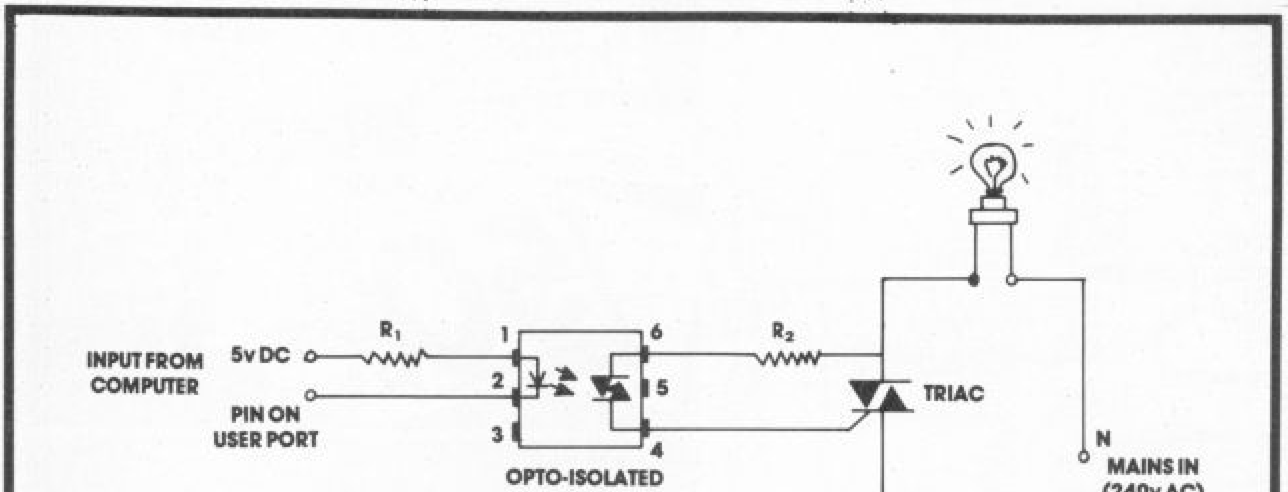


Diagram 2: Using a triac

Computerama 64

the source

ALLIGATA		
Blagger	C	7.95
Guardian	C	7.95
Loco	C	7.95
Panic Planet	C	7.95
Son Of Blagger	C	7.95
A&F		
Chuckie Egg	C	7.90
ADVENTURE INTERNATIONAL		
Pirate Cove	C	9.90
Voodoo Castle	C	9.90
ANIROG		
Galaxy	C/D	7.95/ 9.95
Jungle Drums	C/D	7.95/ 9.95
Flight Path 737	C	7.95
Krazy Kong	C/D	7.95/ 9.95
House Of Usher	C/D	6.95/ 9.95
Moon-Buggy	C/D	7.95/ 9.95
Skramble	C/D	7.95/ 9.95
Cybotron	C/D	7.95/ 9.95
Petch	C/D	6.95/ 9.95
Ice Hunter	C/D	6.95/ 9.95
Zodiac	C/D	7.95/ 9.95
AUDIOGENIC		
Motor Mania	C	8.95
Bonzo	C	8.95
Burnin Rubber	C	8.95
Pegasis	D	12.95
Frantic Freddie	D	12.95
Grand Master Chess	C	8.95
Alice In Video Land	D	12.95
AVS		
System 1500	C	12.95
U.S. GOLD		
Forbidden Forest	D/C	12.95/ 8.95
Caverns Of Khafka	D	12.95
Aztec Challenge	D/C	12.95/ 8.95
Slinky	D/C	12.95/ 8.95
Pooyan	D/C	12.95/ 9.95
O'Rileys Mine	D/C	12.95/ 9.95
Beach-Head	D/C	12.95/ 9.95
Solo Flight	D/C	12.95/ 9.95
Gustbuster	C	9.95
Quest For Quintana Roo	C	9.95
Rolloverture	C	9.95
Dallas Quest	C	9.95
BUBBLE BUSS		
Hustler	C	6.99
Kick-Off	C	6.99
Widows Revenge	C	6.99
Flying Feathers	C	6.99
Bumpin Buggies	C	6.99
BIG G		
Meggahawk	C	6.95
Zylogon	C	6.95
BUG-BYTE		
Twin Kingdom Valley	C	9.95
C.D.S.		
Colossus Chess 2.0	C/D	9.95
C P SOFTWARE		
Pinball Wizard	C	6.95
CREATIVE SPARKS		
Black Hawk	C	7.95
Slurpy	C	7.95
Tower Of Evil	C	7.95
DURRELL		
Scuba Dive	C	6.95
Harrier Attack	C	6.95
Jungle Trouble	C	6.95
EUROBYTE		
Mr Mephisto	C	6.95
IMAGINE		
Cosmic Cruiser	C	5.50
Pedro	C	6.90
INCENTIVE		
Splat!!	C	6.50
INTERCEPTOR		
Arabian Knights	C/D	7.00/ 9.00
Spider & The Fly	C/D	7.00/ 9.00
China Miner	C/D	7.00/ 9.00
Wheelin Wallie	C/D	7.00/ 9.00
Burger Time	C/D	7.00/ 9.00
Aquanaut	C/D	7.00/ 9.00
Wallie Goes To Rhymeland	C/D	7.00/ 9.00
ISP		
Scope	C/D	17.95/ 18.95
K-TEL		
City Attack	C	6.95
It's Only Rock-n-Roll	C	6.95
LLAMASOFT		
Hovver Bovver	C	7.50
Mutant Camels	C	7.50
Mutant Camels Revenge	C	7.50
Sheep In Space	C	7.50
LIVEWIRE		
Grid Trap 64	C	7.95
Jumping Jack 64	C	7.95
Triad	C	7.95
MERLIN		
Crazy Caveman	C	7.95
Blue Moon	C	7.95
Pixie Pete	C	7.95
Orange Squash	C	7.95
MELBOURNE HOUSE		
Hobbit	C+B	14.50
Horace Goes Skiing	C	5.95
Acos+	C+B	8.95

MICRODEAL		
Space Shuttle	C/D	8.95/ 12.95
Cuthbert Goes Walkabout	C	8.00
Cuthbert In Space	C/D	8.00/ 9.95
Cuthbert In The Jungle	C/D	8.00/ 9.95
Danger Ranger	C/D	8.00/ 9.95
MICRO POWER		
Cybertron Mission	C	7.95
Felix In The Factory	C	7.95
Ghouls	C	7.95
Swoop	C	7.95
MIRRORRSOFT		
Caeser The Cat	C	8.95
OCEAN		
Hunchback	C	6.90
Mr Wimpy	C	6.90
Chinese Juggler	C	6.90
Cavelon	C	6.90
PARAMOUNT		
Outback	C	7.50
Meggawarz	C	7.50
PEAKSOFT		
The Boss	C	8.95
QUICKSILVA		
Bugaboo The Flea	C	7.95
RICHARD SHEPHERD		
Urban Upstart	C/D	6.50/ 9.50
SOFTWARE PROJECTS		
Manic Miner	C	7.95
Dinky Doo	C	7.95
SOFTEK		
Bug Squad	C	7.95
Ugh !	C	7.95
Zoids	C	7.95
Quak Attack	C	7.95
SOLAR SOFT		
Bizy Beezzzz	C	7.95
TASK SET		
Jammin	C/D	7.95/ 9.95
Pipeline	C/D	7.95/ 9.95
Gyropods	C/D	7.95/ 9.95
Bozo's Night Out	C/D	7.95/ 9.95
TERMINAL		
Super Dogfight	C	7.95
Super Gridder	C	7.95
Star Commando	C	7.95
Plumb Crazy	C	7.95
Triple Tournament	C	7.95
VIRGIN		
Falcon Patrol	C	6.95
Ambush	C	6.95
VISIONS		
1994	C	6.95
Breedons Basic	D	39.95
Dare Devil Dennis	C	6.95
Demolator	C	6.95
Nifty Lifty	C	6.95
Dos	D	19.95
PRINTERS FOR 64		
Commodore 1526		345.00
1520 4 Colour Printer Plotter		99.95
Commodore MPS-801		229.00
Epson RX80		269.00
Epson RX80 FT		299.00
Epson FX80 Package		419.00
Juki 6100 Daisywheel		448.00
Centronics – Monitor Interface		29.95
Centronics – Cassette Driver		9.95
Centronics – Cable		19.95
MONITORS		
Commodore 1701 Colour		225.00
Fidelity 14" Colour		199.00
Sanyo 12" Green		99.00
ACCESSORIES		
THE POWER OF 64 CP/M Commodore 64 Z-80 Second processor Cartridge Complete with CP/M 2.2 Giving You The Chance to Use your 64 under the most widely used machine Operating system.		50.00
1541 Disk Drive + Easy Script + Future Finance + 6 Free Games		229.00
C2N Cassette Recorder		44.90
C2N Compatible Recorder		34.95
Cassette Interface		14.90
Deluxe Dust Cover		5.95
Tac II Joystick		18.95
Quickshot II Joystick		10.95
Wico Trackball		34.95
Light Pen		27.95
IEEE Interface		87.00
Rs232c Interface		27.90
Tripler 20/64 Interface		45.00
COMMODORE BUSINESS SOFTWARE		
Easy Script	D	74.95
Easy Spell	D	49.95
Future Finance	D	74.95
Easy Stock	D	74.95
BUSINESS GAMES		
High Flyer	D	11.99
Rail Boss	D	11.99
UTILITIES		
Intro to Basic part I	C/D/ +B	14.95
Intro to Basic part II	C/D/ +B	14.95
Gortec & Microchips	C	14.95
Assembler Tutor	C/D	29.95
Assembler Dev'lopment	D	24.95
Programmers Utilities	D	14.95
Petspeed 64	D	49.95
Simons Basic	R	44.95
COMMODORE GAMES SOFTWARE		
Lemans	R	9.99
Pinball Spectacular	R	9.99
Wizard Of Wor	R	15.00
Gorf	R	15.00
Lazarian	R	9.95
Tooth Invaders	R	9.95
Omega Race	R	9.95

3rd PARTY BUSSINESS SOFTWARE		
Micro Simplex	D	172.50
Multiplan	D	79.95
Practicalc	D/C	39.95
Practifile	D/C	39.95
Inventory 64	D/C	29.95
Superbase 64	D	89.95
Wordcraft 40	R	89.95
Magpie	R	99.95
Templates For Magpie	D	29.95
DIALOG		
Database + Labels	D/C	34.00
DFM Database	D/C	24.00
HANDIC		
Diary 64	D	44.85
Calc Result	D+R	99.00
Easy Calc Result	D	49.95
Paper Clip	D	98.90
ADVENTURE INTERNATIONAL		
Diskey	D	36.00
The Hulk (Scott Adams)	C	9.95
ACCESS		
Neutral Zone	D	24.95
ATARISOFT		
Centipede	R	39.95
Defender	R	39.95
Donkey Kong	R	39.95
Pac-Man	R	39.95
Dig-Dug	R	39.95
Jungle Hunt	R	39.95
Pole Position	R	39.95
BRODERBUND		
David's Midnight Magic	D	24.95
Choplifter	R	26.95
Serpentine	R	28.95
Seafox	R	28.95
Spare Change	D	24.95
Drol	D	25.95
Lode Runner	D/R	24.95/29.95
DATAMOST		
Aztec	D	28.95
Swashbuckler	D	24.95
Roundabout	D	21.50
Bilestoad	D	21.50
Mating Zone	D	21.50
Paint Wizard	D	35.95
Wizz n'Roo	D	24.95
Monster Smash	D	24.95
Toopsee-Turvee	D	24.95
DATASOFT		
Moon Shuttle	C/D	18.95
ELECTRONIC ARTS		
One on One	D	29.95
Hard Hat Mack	D	29.95
Worms	D	29.95
Mule	D	29.95
Pinball Construction Set	D	29.95
Music Construction Set	D	29.95
Archon	D	29.95
Murder on the Zinderneuf	D	29.95
Axis Assasin	D	29.95
EPYX		
Crush Crumble Chomp	D	20.45
Curse of Ra	C	13.45
Jump Man	C/D	27.50
Jump Man Junior	R	28.95
Pitstop	R	33.15
Sword of Fargoal	C/D	20.50
Temple of Apshai	C/D	24.95
Upper Reaches of Apshai	C/D	13.50
Lunar Outpost	R	27.95
Gateway to Apshai	R	28.95
FIRST STAR		
Astro Chase	C/D	24.95
Bristles	C/D	24.95
Flip and Flop	C/D	24.95
FUNSOFT		
Snokie	C/D	24.95
HAYDEN		
Sargon Chess II	C	28.95
INFOCOM		
Deadline	D	34.95
Starcross	D	28.95
Zork I, II & III	D	14.95
Suspended	D	14.95
Witness	D	34.95
Planetfall	D	34.95
Enchanter	D	34.95
Infidel	D	34.95
MUSE		
Castle Wolfenstein	D	24.95
Rescue Squad	D	24.95
SCREENPLAY		
Pogo Joe	C/D	25.95
Kaiv	D	25.95
Wylde	D	25.95
SIERRA ON LINE		
Crossfire	D	21.95
Frogger	C/D	24.95
Threshold	R	27.95
Jawbreaker	D	27.95
Mr Cool	D/R	27.95
Sammy Lightfoot	R	27.95
Apple Cider Spider	R	27.95
SEGA CONSUMER PRODUCTS		
Star Trek	R	28.95
Buck Rogers	R	28.95
Congo Bongo	R	28.95
SIRIUS SOFTWARE		
Snake Byte	D	24.95
Bandits	D	29.95
Way Out	D	29.95
Blade of Blackpoole	D	22.50
Fast Eddie	D	24.95
Turmoil	D	24.95
Repton	D	29.95
Squish 'em	D	24.95
Gruds in Space	D	27.50
Wavy Navy	D	29.95
SSI		
Geopolitique	D	29.00
STRATEGIC SIMULATIONS		
Knights of the Desert	D	29.00
Combat Leader	D	29.00
Eagles	D	29.00
Ringsie Seat	D	29.00
SUBLOGIC		
FLIGHT SIMULATOR II	C/D	34.95
Night Mission Pinball	C/D	21.95
TRONIX		
S.A.M. speechsynthesis	D	39.95
Juice	D	27.95
Slalom	D	27.95
Kid Grid	D	27.95

64 EXECUTIVE OUTFIT

Add Disc Drive and Printer to your 64 at an unbelievable saving

1541 Disc Drive	£229.00
MPS 801 Printer	£229.00
Easy Script W/P	£ 75.00
Easy File	£ 50.00
Intro to Basic Pt 1.	£ 14.95



~~£597.95~~

OUR SUPER LOW PRICE ONLY £399.00

SAVE ALMOST £200 ON LIST

MPS 801 PRINTER ONLY £169

Our prices are the BEST. If you find that you could have bought an identical product, currently advertised and in stock at a lower price, we will CREDIT the difference.

EPSON FX80
For The Commodore 64

COMPLETE COMMODORE PRINTER OUTFIT

Our most popular HIGH PERFORMANCE matrix printer. Supplied together with everything you need to connect to your 64. You get the printer and the Computerama centronics interface kit. This revolutionary new interface is the most comprehensive utility of its kind, it works with all Epson and code compatible printers. We have yet to find a program that is not compatible. Enjoy Epson quality and speed tomorrow. ORDER TODAY.



ONLY £419

complete inc vat.

COMMODORE 1541 DISC DRIVE

SAVE £150



FREE - Easy Script word processor, Future Finance and six disc based games with every 1541 Disc Drive. But HURRY, this very popular offer must end soon.

ONLY £229 inc vat.

FREE software

We endeavour to despatch within 24 hours on stock items.

QUICKSHOT II
Deluxe Joystick Controller

- **NOW WITH RAPID FIRE FEATURE**

The latest version of this most popular of all joysticks

- Robust, Accurate & Responsive
- BETTER MADE For longer life
- Long cord & TOUGH moulded plug
- Self-centring Joystick at an unbeatable price
- TWO Fire buttons – for maximum control & comfort
- PISTOL GRIP – comfortable over many exciting hours of game play

ONLY £10.95 inc VAT



REACHES THE SCORES OTHER JOYSTICKS CAN'T

WE CHALLENGE YOU to order an item we can't supply. Give us 7 days, if we can't despatch we will send you a FREE GIFT – And return your cheque.



FREE with every order, five pounds worth of moneysaving vouchers

ORDER BY MAIL
No Stamp Required
Post your order today to
COMPUTERAMA
DEPT. CU8
FREEPOST
STAFFORD ST16 2BR

ORDER BY TELEPHONE
For ACCESS or VISA 24 hour ORDER HOT-LINE
Dial 0785 44222

CARRIAGE
50p postage on all orders under £25
Securicor delivery on high value items £8 eg printers, monitors, disc drives

Computerama 64

STAFFORD	STOKE-ON-TRENT	SHREWSBURY
59 Foregate Street	11 Market Square Arcade.	13 Castle Gates

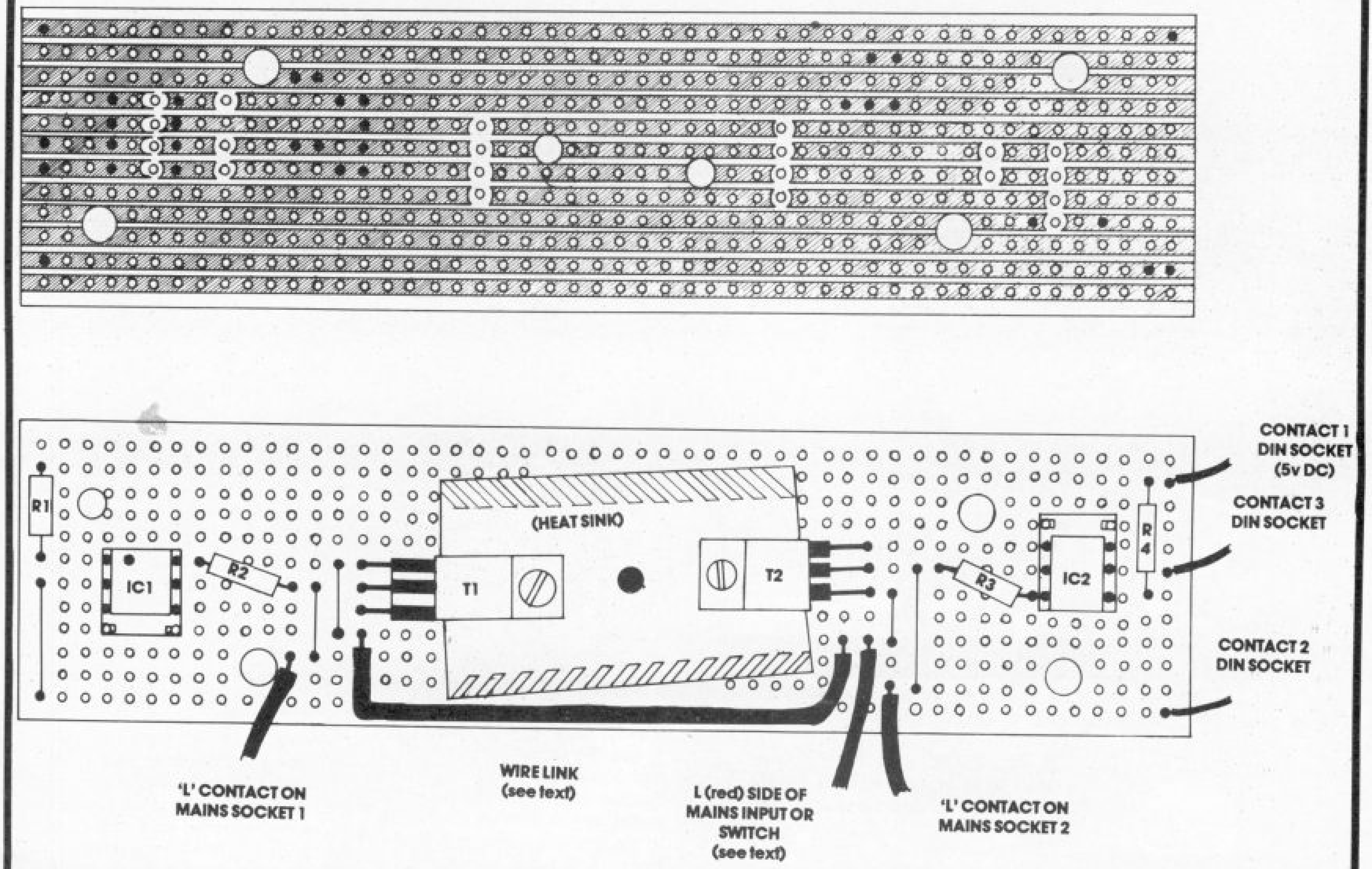


Diagram 3: PCB layout for a two-triac system

The triacs used are rated up to 8 amps each; if you wish either circuit to control a higher current than this you must replace them with a suitably rated triac (note that the 'tab' *must* be isolated from all pin connections – check before you buy them).

Remember that if your control unit is to handle two devices, the *total* current for both must still not exceed 13 amps; this also applies if you fit more than two control units in a box.

The insulated wire link mentioned in **Diagram 3** is there to reduce the current flow in the copper strip carrying the mains voltage; other mains connections are close together for the same reason.

Once you have built and checked the control board you can mount it in a box of your choice. The mains input lead should be terminated in a screw-terminal connector; the Earth and Neutral wires are then connected directly to the output sockets. The Live wire is taken either directly to a board or to a switch (see **Diagram 4** for switch connection details) – the switch would allow the unit to be powered up without the computer being connected. Two neon lamps are provided to indicate the state of each socket. The neons are wired across the Live and Neutral connections on the output sockets.

Rather than have a fixed lead to the computer, I have also fitted a 3-pin DIN socket to the side: the lead from the computer can be plugged into that. The reason for this will become clear next month when we expand our basic system.

Testing the Control Unit

The first thing to do is make sure that the unit works. Check the

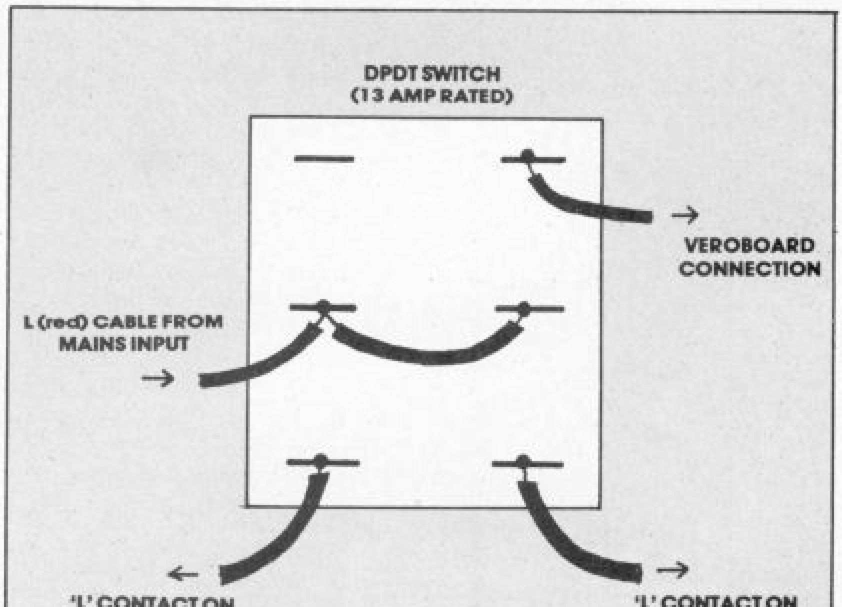
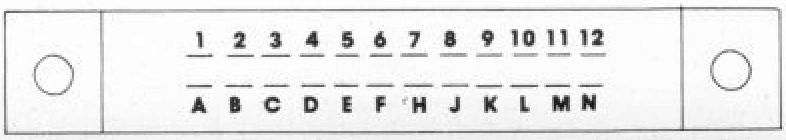


Diagram 4: Switch construction



REAR OF USER PORT CONNECTOR

PIN	CBM 64	VIC 20
1	GND	GND
2	+5v (100mA max)	+5v (100mA)
3	RESET	RESET
4	CNT1	JOY ∅
5	SP1	JOY 1
6	CNT2	JOY 2
7	SP2	LIGHT PEN
8	PC2	CASSETTE SWITCH
9	SERIAL ATN	SERIAL ATN IN
10	9v AC (+phase)	+9v AC
11	9v AC (−phase)	GND
12	GND	GND
A	GND	GND
B	FLAG2	CB1
C	PB0	PB0
D	PB1	PB1
E	PB2	PB2
F	PB3	PB3
H	PB4	PB4
J	PB5	PB5
K	PB6	PB6
L	PB7	PB7
M	PA2	CB2
N	GND	GND

Diagram 5: The User Port



construction, especially to ensure that there are no solder 'bridges' between tracks on the veroboard. Ok? It's time to plug it in.

Items used for Control Box

- desk console type 2 (Maplin code – LH66W)
- two mains sockets (RS 489-425)
- DPDT rocker switch
- two mains neons
- 3-pin DIN socket
- 3-pin DIN plug
- four PCB mounting pillars
- screw-terminal connectors

Supplier codes have been given for less common items. Note that RS Components Ltd do not supply items direct, you must obtain them through a dealer. Maplin does mail order and also has retail outlets; call 0702 554155 for details.

If you have a switch fitted, turn this to 'computer control' and plug the unit into the mains *without* any connection to the computer just yet. Plug a table light or something similar into each socket in turn; all sockets should be dead. Now turn the switch, if fitted, to the 'mains' position and retest all the sockets; this time the sockets should be live.

If you have a 4.5v or 6v DC supply handy you can now carry out a further test. Insert a three-pin DIN plug into the socket on the side of the box; connect the positive terminal to contact 1 on the DIN plug and then connect the negative terminal to each of the other two contacts in turn. With the switch set to 'computer control', each socket should be switched on when the negative terminal is connected to its respective contact.

Connecting to the computer

For the twin unit single low-voltage three-core cable is needed plus a User Port connector and a three-pin DIN plug. The connections on the User Port are shown in **Diagram 5** together with a description of each pin. Connect the wire from contact 1 on the DIN plug to pin 2, and the wires from contacts 2 and 3 to pins C and D respectively (subsequent control boxes should also be connected to pin 2 plus the next two data lines – E to L – in sequence).

Plug the User Port connector into the computer before switching it on. Now turn on the computer and type the following commands in direct mode:

CBM 64 – **POKE 56579,255: POKE 56577,255**
Vic-20 – **POKE 37138,255: POKE 37136,255**

You can now plug the cable into the DIN socket of the control unit; both mains sockets should be off. To control the sockets you can use the following code, where **X** is the socket number (1 to 8):

POKE 56577,PEEK(56577) AND (255−(2 ↑ (X−1))) *to turn socket X on*

POKE 56577,PEEK(56577) OR (2 ↑ (X−1)) *to turn socket X off*

That's for the 64. For the Vic, replace 56577 by **37136** in all occurrences. Don't worry for the moment about how the code works; all will be explained in greater detail next month.

Next month ...

At present we are using one line from the User Port to control one device: next month we'll show how to control eight devices using only four lines, with full latching, plus a program to give easy and simple control. For those who don't know one end of a soldering iron from the other we also look at some commercial units. Don't miss next month's instalment!

Component List

Resistors

R1,4	390
R2,3	150

Triacs

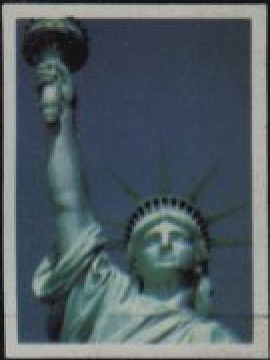
T1,2	RS T2850D

Opto-Isolators

IC1,2 – RS 308-196 (MOC 3020: 308-196 (MOC 3020: Maplin equivalent – QQ10L)

Hardware Items

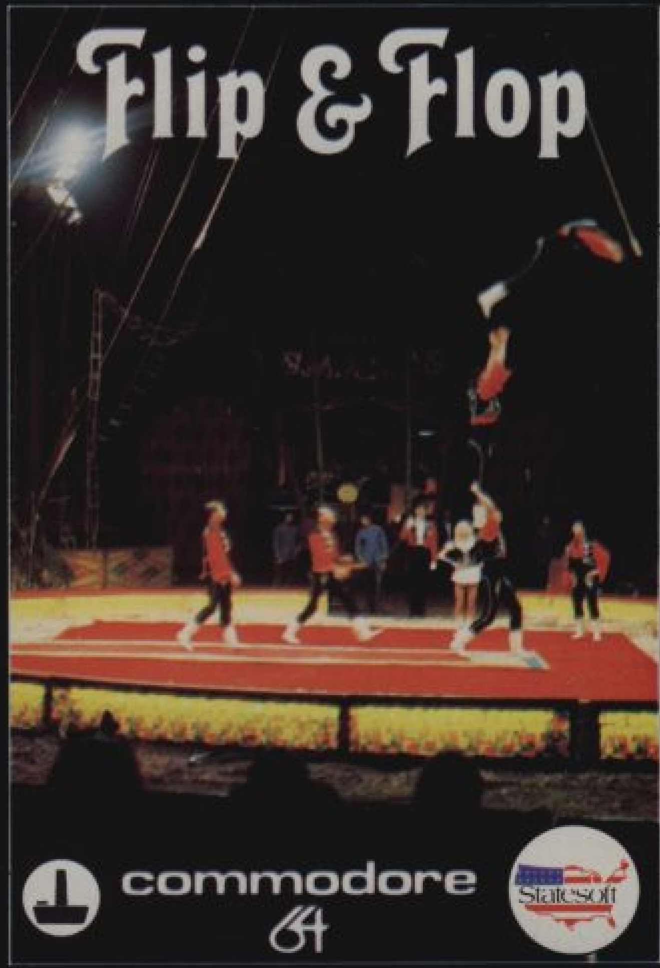
Veroboard 127 x 31mm
heatsink (Maplin code – FG55K)
two 8-pin DIL sockets
User Port connector



AMERICAN

Big, Bold and Beautiful...





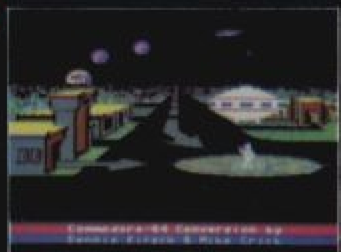
34 SCREENS

3D Graphics and Cartoon Animation

... Most Innovative Software, 1983
Software Showcase, Chicago, USA

Computer Game of the Month
The Whiz Kid, Dealerscope Magazine, USA

Science Fiction/Fantasy Game of the Year, 1984
Electronic Games Magazine, USA





36 SCREENS

3-D FLIP AND FLOP, join Flip the Kangaroo and Mitch the Monkey in their escape from the zoo of the future to join their friends back at the circus. Great animations, 36 levels of play, 13 different game screens, fully orchestrated music, 1 or 2 player option and more and more .... Guaranteed to make you Flip'

Cassette £8·95
Disk £10·95

JOYSTICK

Really Something Else

Statesoft

State soft in association with 'First Star' N.York, USA

STATE SOFT LIMITED,
BUSINESS AND TECHNOLOGY CENTRE,
BESSEMER DRIVE,
STEVENAGE, HERTS. TEL: 0438 316561

I wish to pay by cash/cheque/Postal Order/Access
To ACCESS:-
I authorise you to debit my Access
Account with the amount of £ ____________
My ACCESS No. is

____

Name (as on Access card) ....
Cardholder's address ....
....
Signature ....


synsoft presents...
The World's Greatest Games!
The Unsurpassable Experience.
synsoft
The Official ZAXXON
Selected Titles available soon for Spectrum
64 ATARI
DRELBS
Your Dreib builds glowing squares, but his enemies knock them down. And if you let them they'll even gobble up your lovable Drelb. Quick reflexes, intelligence and strategy are a must for this addictive change-of-pace game.
Play one of the most challenging arcade games on your C-64 computer. ZAXXON's incredible 3-D graphics, diagonally scrolling screen and super sound are reproduced in great detail. Hang onto your joystick, keep firing and practice. You may eventually encounter the deadly Zaxxon himself!
SENTINEL
Exciting 3-D action! The most realistic point-of-view game you've ever played! Navigate through asteroid belts, destroy enemy ships, track their battlestars through intergalactic minefields. How can you prevent the enemy capturing your planet?
BLUE MAX
Shoot down enemy planes, bomb targets, strafe tanks . . . there's constant action on the incredible 3-D scrolling screen. You must master a series of flying skills and perform them with pinpoint accuracy. One slip and you've lost it all! Happy landings, ace!
synsoft
U.S. GOLD All American Software
Play this multi-level extravaganza three different ways. Fire on vile enemies, navigate deadly hazards, rescue 18 trapped friends, make your way through treacherous caves! Super graphics, unnerving sounds and constant scrolling screen.
CASSETTE £9.95
DISK £14.95
THE ULTIMATE IN AMERICAN SOFTWARE FOR YOU ON U.S. GOLD
U.S. Gold is stocked by all leading computer stores including:
Boots John Menzies WHSMITH WILDINGS WOOLWORTH
U.S. Gold Ltd., Unit 24, Tipton Trading Estate, Bloomfield Road, Tipton, West Midlands DY4 9AH Telephone: 021-520 7591. Telex: 337268.

The Forth Dimension:

Programming with a DIY Language

Part one – simple numbers

by Richard G Hunt

In this series of three articles I shall try to look at Forth from a beginner's point of view, introducing the more common Forth words and how they are used. The more advanced stuff I shall leave to the text books by Brodie and Winfield, at least for the time being.

All you need is a computer with a Forth implementation and a will to experiment ...

These articles differentiate between Forth words (FORTH), input at the keyboard of specific keys (RETURN), input of direct commands > 25 + . < and the system response or output (such as MESSAGE # 1 OK, or EMPTY STACK OK)). Some Forth systems may use upper- or lower-case characters. My use of upper-case letters is merely for clarity (and because the word processor I use is in itself rather simple).

Any new defintion for entry to the dictionary will appear in this series as a standard colon definition. For example ...

: NEWWORD ELEMENT 1 ELEMENT 2 etc;

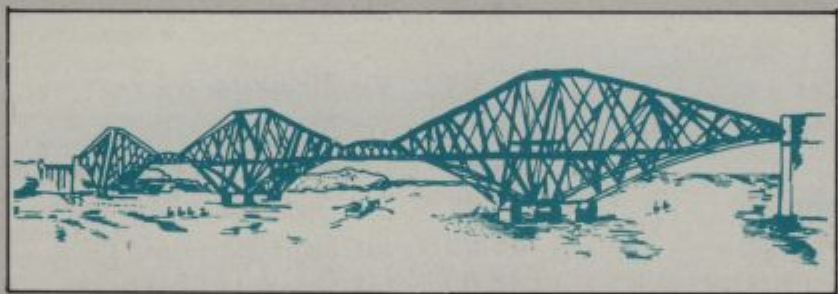
Note that all spaces are part of the syntax – two or more may be left between the name of the new word and its constituent parts.

Forth is an interactive language that you can experiment with at the keyboard. It is also a language that allows you to make up your own commands or words (indeed it *insists* that you do so) and causes them to 'run' a program. Given that Forth words are the building blocks of a program it is very much a case of DIY at the keyboard.

Such are the tools needed by the beginner to cobble together your first Forth programs.

Forth programming starts out with a defined objective – which may be as grandiose as a fast Pacman game, or as simple as an additional entry to the dictionary. The objective must be *clearly* stated because strangely Forth seems to go against the normal rules of entropy – the effect must be defined before the cause is coded!

Supposing you have just acquired Forth and switch on for the first time. What do you see?



What must you do? The system will first display a message indication which and whose version of Forth is loaded. This should tell you that the system is ready for you. You might press (RETURN) and see that the system responds OK: it's *still* ready for you.

You might try to add two numbers, say, display the sum of 2 and 5. For this you need the Forth words (+) and (.). The latter – the dot – outputs numbers (specifically, signed integers) to the screen. It also operates on the data or parameter stack, which is the work area Forth uses for handling all numerical data.

If you are familiar with BASIC you might try to enter > . 2 + 5 <, assuming that you are giving a logical progression of commands. The system will not display what you expected.

Depending on the implementation you may see:
. EMPTY STACK, OK or
. MESSAGE # 1 OK, or even
. OK. These are some of several error messages caused by wrong syntax. But in this instance they're also indicative of Forth's requirement for postfix or Reverse Polish Notation (RPN), wherein the arithmetic operator (+) is placed *after* the operands (2) and (5).

It follows that any output command can logically only *follow* the operation which produces the sum, product or whatever. If you now enter > 25 + . < the system will respond 7 OK.

Now what happened?

The system has taken the numbers 2 and 5 and pushed them on to the data stack. If your system has a non-destructive stack contents display word like (.S), try entering each word separately and then display the stack:

>2<RETURN> OK
>.S<RETURN> 2 OK
>5<RETURN> OK
>.S<RETURN> 2 5 OK

... and so on.

Incidentally, here's a non-destructive stack print – courtesy of ICPUG:

: DEPTH sp@ 138 (VIC, or 123 C-64) swap – 2 /;
: .S cr depth if sp@ – 136 (VIC, 121 C-64) do i @ . –2 +loop else ."stack empty" then ;

It can then be seen from our example that the last or topmost number on the stack is the one on the right, or last to be displayed – as with all stacks a FILO (first in last off) system applies.

When an operator like (+) is encountered, the system looks to the stack for the required number of operands; it then pops them off the stack and replaces the result on the top of stack (TOS).

(.) looks for only one parameter and pops it off the stack and on to the screen. The other mathematical operators – which are (–), (*) and (/) – function similarly, as do the logical operators – (=), (>), (<), (0=), and so on.

Forth supports mixed function operators also such as (*/), (/mod) (mod) and others that relate to double or unsigned numbers, about which more anon – though (/mod) is a variant of (/) that leaves the quotient and remainder on the stack, very useful bearing in mind that Forth employs only integer arithmetic. So if you enter .2001 20.01 200.1 and 2001 Forth will display them all as 2001.

The textbooks correctly indicate that handling Forth numbers – which means use of the stack, RPN and integer arithmetic – is worth practicing. The concept is that if the programmer can order the mathematical operations correctly before coding the machine response in Forth becomes that much speedier than using conventional algebraic ordering systems and floating point arithmetic. If you now wish to take pen and paper and try factoring out a quadratic equation to fit RPN, please feel free: there'll be no help from me!

Next time, we'll come to something more interesting and put together a few new word definitions. Until then try using Forth as a calculator, using the operators + – * / /MOD.

Now there's a selection of hardware to match our selection of software.

At HMV we've just installed the latest ranges of hardware and peripherals alongside the massive selections of software in our Computer department. So whatever you need, whether it's a disk drive, or a Voodoo Castle or simply some expert advice, you'll know exactly where to find us.

Commodore 64	199.00
1541 disk drive	199.00
Commodore colour monitor	199.00
MPS801 dot matrix printer	199.00
Commodore C2N cassette recorder	44.95
Datex Commodore compatible cassette recorder	34.95
Memorex 40T diskettes (for 1541) box of ten	19.99
Gemini Business Software	from 24.95
Simon's Basic (Cartridge)	50.00
Petspeed Compiler (Disk)	50.00
Z80/CPM (Cartridge and Disk)	50.00
Intro to Basic part 1 (Cassette or Disk)	14.95
Intro to Basic part 2 (Cassette or Disk)	14.95
Zork 1, 2 & 3 Adventures (Disk) each	11.95
International Soccer (Cartridge)	9.95
Voodoo Castle (Cassette)	9.95
Solo Flight (Cassette)	9.95
Son of Blagger (Cassette)	7.95
Killer Watt (Cassette)	7.95
Contract Bridge (Cassette)	9.95
Flight Path 737 (Cassette)	7.95
Encounter	8.95
Football Manager	7.95
Pool Challenge	9.95
The Quill	14.95
Valhalla	14.95
The Hulk	9.95
Snooker (Cassette)	8.95
Twin Kingdom Valley (Cassette)	9.50
Black Hawk (Cassette)	7.95

Complete range of Commodore, Mogul and Level Nine software.

Complete range of Interceptor and Anirog software on Disk.
Large range of American Import on disk.
Selected Alligata and Software Projects titles.
Large range of Educational Software.

Vic 20 starter pack	139.95
Vic 20	99.00
Commodore C2N cassette deck	44.95
32K Switchable RAM pack	49.95
16K Switchable RAM pack	34.95
16K Standard RAM pack	27.95
Jet Pack (Cassette)	5.50
The Count (Cartridge)	9.95
Mutant Herd (Cartridge)	9.95
Hell Gate (Cassette)	6.00
Metagalactic Llamas (Cassette)	5.50
Radar Rat Race (Cartridge)	9.95
Computer War (Cassette)	5.95

Complete range of Commodore and Llamasoft software.

Also: BBC, BBC/Torch, Memotech, Sinclair, Hardware and Software, and a large range of books on various subjects.

Ring 01-629 1240 to check for availability. All prices include VAT. Prices may change without notification.

the HMV shop

The Computer Dept., 1st Floor, 363 Oxford Street. (Next to Bond St. Tube)

ALL OFFERS SUBJECT TO AVAILABILITY

Word processing and more?
Home Office reviewed by Chris Durham

Home Office has been available for the Vic-20 for some time. So it's not surprising that a version has now surfaced for the 64. But it's still a tape-based program costing £16.95. For the money, you get two programs: a word processor and a database. And at that price you're bound to be asking suspicious questions. Chris Durham finds out if this package really does do the jobs intended for it.

Wordpro — the writer

Those of you who have been following the series on word processors will know that there are three functions that any WP program must be capable of doing reasonably well if it is to be of any use at all; these are *inputting text*, *outputting text* and *editing text*. A weakness in any of these areas tends to reduce the program's usefulness to the user.

Inputting text

On the first of these, Wordpro is adequate and no more; the cursor keys are all disabled so that the only way to correct an error while you're still typing the line is to delete all the text back to the error and then retype it. Too bad if you made a mistake on the second letter and only noticed it halfway along the line.

The line length is initially limited to 65 characters, although this can be altered by adjusting the margin settings if needed. When the word you are typing is too long to fit on the line, it hyphenates the word at the last character position; however if you type a word that ends just short of the full line width then the cursor automatically steps on to the next line; thus in practice very few words get split. This is one of the nicer functions of the program.

The program uses two lines on the screen to give one line of printed text, so every other line suffers from word-wrap, which makes it a little difficult to read. It also gives problems when editing, of which more later.

There are five tabs available and these must be set up when you begin your document. Tabs are selected by using the '*' key, pressing it as many times as the required tab number. Because the program uses standard keys like '*' for the tab and '=' for returning to the menu, you can't use them for text.

There is a way of getting round this problem if you're using an Epson printer, but not otherwise; my immediate and slightly uncharitable thought was 'who on earth is going to spend nearly £300 on a printer then buy a cheap WP like this?'.

Another key you cannot use under any circumstances is the quotation mark or **(shift 2)** key; rather a vital key for word processing I would have thought! What's wrong with the function keys? They use them for printer selection when it doesn't really matter so why not in the main section?

The maximum number of lines allowed depends on the line width, but is 234 with a default line width of 65 characters. This is quite adequate for the sort of thing you would use this program for.

Printing the text

You have two basic options with this program: you can either use a Commodore printer attached to the serial port, or a Centronics parallel printer plugged into the User port using the program's built-in interface. Note that a Centronics printer connected with a converter to the serial port will *not* work as it prints a 6 at the start of each line! The program appears to send a control character at the end of each line, although this could be a combination of the program and the interface. But it does work well with just a cable connection to an Epson from the User port.

Printing can be right justified; in other words the right hand margin can be made straight by padding out each line with extra space between words. The result is all one could wish for, except it does it in slow motion on the screen half a line at a time before sending it to the printer; totally unnecessary and a complete waste of time and programming effort. The effect of watching it happen is totally incomprehensible anyway, and the program writers would have been better off spending more time on the important bits.

Various options are allowed after selecting the print option from the menu; there are facilities to set the print type, emphasis, double spacing etc. These have been well thought out on the whole. The only restriction is that the options apply to the whole document; you cannot print some lines or words emphasised, and some normally. The majority of the options are selected using the function keys. Headings and initial blocks of text can also be centred.

Editing

I have left this till last because it is without doubt the part of the program which puts it beyond the pale. It is the worst method of editing I have ever seen on a wordprocessor, including some costing only £6! Basically it uses a line editor; that wouldn't be so bad if you could actually edit the line, but you can't even do that. You actually have to retype the whole line in full, even if the only error was a single wrong character. Adding text to a line is impossible unless it is a small word which can be squeezed on within the line limit. The only alternative is to insert a new line. This is fine if you *want* to add a whole line, but very annoying if you only want to add one long word.

Since the text is completely limited to the line it's on, it does not sort itself out if you delete a few words (by not retyping them!); what you end up with is a large gap at the end of the line. There is a 'whole line deletion' option, but if you want to delete all but the last two words and they won't fit on the next line, you have a problem.

Neither are there facilities for block moves or for copying, perhaps not surprisingly at this price, but what it means is that this is a WP program with fewer editing options than the 64's Basic editor; I find that quite incredible.

Files can be saved to both tape and disk and loaded again very easily. These functions worked well and all errors were trapped. There is an option in the main menu to load the directory; a useful facility which does not destroy the contents of memory.

Database — the clerk

This is billed as "a highly sophisticated Storage and Retrieval system ... designed for the home or small office". If you leave off the 'highly sophisticated' part, that isn't too unfair a description of this program. It is designed to allow you to store a number of single line records; about 380 if you limit the record to 80 characters. As a crude lookup file with the ability to sort the (single) key field, it is quite effective; main uses being a telephone directory, stamp catalogue or record catalogue – and these may not be mightily useful.

Creating a file

This is very straightforward; you are asked to specify the record length, the default being 92 characters. But you can't specify any kind of structure to the record since it's all on one line with no punctuation of any type allowed. That means that the only way to separate information within the record is with spaces; any attempts to use commas, full stops, colons etc causes the record to be rejected or it ignores everything after the 'bad' character.

Once you have specified the record size you can start inputting the data. The first thing to specify is the 'key'. This is any alphabetic string up to 22 characters and it is this key that is used for searches and sorting. After that, you will see a white 'bar' which represents the maximum length of the record. In total contrast to the WP program, here you mustn't use the Delete key otherwise the white 'bar' gets shortened as well; you can only edit using the cursor keys.

This really represents pretty poor programming where the user is forced to adapt to the program's inadequacies, rather than making the user's life easier. I know it's the cheap end of the market, but ...!

When you have input the first record you are returned to the main menu and must reselect the 'new data' option; you repeat this procedure until all the records have been entered. You can now select option 7 which will sort the records into alphabetical order. This is reasonably fast for a program written in Basic; it also enables the search routine to find records much faster.

Accessing records

There are two main ways of getting at your data again; either by searching the file for specified records or by typing the whole file out on the printer. If you wish to search for a particular record then option 3 asks for the keys; a good point is that it allows you to specify part of a key, to find all records which match. For example: specifying **SM** as the key in a directory would find Smith, Smyth, Smithers, Smurthwaite etc. Whenever a record is accessed in this way you have the option of changing it or printing it. But two pitfalls await you. If you select the change option by mistake, or change your mind after selecting it, then there is no way of aborting it; you must retype the entire record again.

If you are an optimist like me, you might expect that pressing Return without making any changes would retain the existing record. In fact it deletes it; the key remains, but the data field is blanked! Not that it tells you; you have to re-search for the record to discover what you have just done. It would have been nice if you had to confirm the change; after all, the WP program does just that. The second pitfall occurs if you select the wrong printer stream; the program does warn you that the printer must be on line, but when using a parallel printer on the serial port I hit 'p' instead of 's' by mistake. The result was a crashed program and a lost database – be warned.

Saving and loading

As with any database system, you really need disks. By the time you have loaded the program from tape, run it, loaded the data from tape, found the record and printed it, you would have been quicker looking up the entry in a card index. Life is much faster with disks. Even a reasonably large file loads fairly quickly and the search routine is not too slow; even so it is only on large amounts of data that you will really see the benefit of storing it on computer. This is not a criticism of this program since it applies to all similar small databases.

Accessing the disk directory is straightforward, being an alternative to saving or loading after making the initial selection. As with the WP program, no data is lost when accessing the directory.

The manual

This covers both the WP program and the database, is 20 pages long and perfectly adequate. Although there is no index, the contents page is sufficient to find your way to all the sections. My only real bone of contention was the advertising-type blurb which almost contravenes the Trades Descriptions Act! Gross examples include "offers facilities far in advance of any other program available to Commodore 64 users at many times the price" and "this Word processor has been set up for maximum speed and efficiency". Whoever wrote that had obviously never used it!

Conclusions

The Database program is adequate for what it sets out to do, bearing in mind the price. Provided you are aware of the limitations and the pitfalls, it can help to maintain data in an orderly format and will not cause you too much frustration.

Unfortunately the same cannot be said for Wordpro. Even taking price into account I really cannot recommend this wordprocessor for anything other than playing about. The frustrations which the appalling editing facility imposes would guarantee that many people will find it easier to put pen to paper than to try to retype a document which has more than a few minor errors.

I am disappointed and not to say a little surprised at Audiogenic since the (comparatively) expensive WP program they sell, *Wordcraft 40*, is very good. Why they have agreed to sell *Home Office* when it can only damage their reputation for good software I really don't know. The writers have tried to put too much into too small a program at too cheap a price – the result is that even at this price it's not worth the money.



Summary of facilities	
Use of 64 facilities	1
Editing	0
Ease of use	1
Output formatting	2
Printer support	2
Document size	2
Manual	2
Disk/tape facilities	3
Mail-merge	0
Error handling	3
Spelling check	0
80-column option	0
Overall facilities	1
TOTAL POINTS	**17**

(Each field is scored out of 5)

Home Office on balance

For

- Comes complete with Database program
- Has built-in Centronics interface
- Price

Against

- Very limited facilities overall
- Extremely poor editing facilities
- Text does not appear on screen as it will be printed

Under review	Home Office
Description:	Combined wordprocessor and database for the 64
Supplier:	Audiogenic Ltd
Address:	39 Suttons Industrial Park London Road Reading Berks RG6 1AZ
Telephone:	0734 664646
Summary:	Too much crammed into too small a package – not worth the money.
Price:	£16.95

PRICE BREAKTHROUGH

Now only £59·95 inc V.A.T.



VIC and 64 users

Would you like to be able to access **any** of these peripherals from your computer?

- ⅓ megabyte disks (Commodore 4040 drive)
- 1 megabyte disks (Commodore 8050 drive)
- 10 megabyte disks (Commodore 9090 hard disk)
- Printers including a wide range of inexpensive IEEE and RS232 matrix and quality printers
- IEEE instruments such as volt meters, plotters etc.

Now you are no longer limited by the VIC or the 64's serial bus. Simply by attaching INTERPOD you can vastly increase the power of your VIC 20 and when used with the new 64, INTERPOD turns the computer into a really powerful system.

With INTERPOD the VIC and 64 become capable of running really professional quality software such as Word-processing, Accounting, Instrument control and many more.

INTERPOD will work with any software. No extra commands are required and INTERPOD does not affect your computer in any way.

Using INTERPOD is as easy as this:

Simply plug INTERPOD into the serial port of your computer, power-up and you are ready to communicate with any number of parallel and serial IEEE devices and any RS232 printer.

Price includes V.A.T., Postage and Packing. Delivery normally 14 days. Export orders at no extra cost. Dealer enquiries welcome.

Send cheque/PO now to:-

INTERPOD

Cheetah Marketing

Cheetah Marketing Ltd, 24 Ray Street, London EC1R 3DJ. Tel:01 833 4909. Telex:8954958.

Our regular round-up of games reviews

We get to see a lot of games here at Commodore User, so many in fact that we can't handle all the reviewing ourselves – we farm out some of them, which is why our reviews have someone's initials at the end of them. We look at everything we get, but we don't necessarily print all the reviews we write: instead, we tend to stick with (a) all the best games we come across and (b) those games that you're most likely to find in the shops or the mail order ads.

MAX
Vic-20 (unexpanded)
Joystick or keyboard
Price £4.95

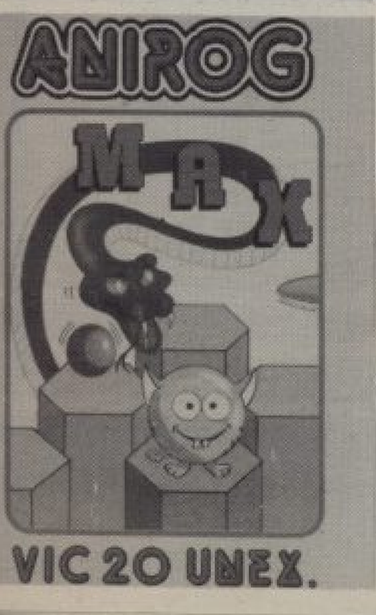
Anirog describes *Max* as a charming furry creature who used to live on a far away planet. He probably wishes he'd stayed there as he now spends his time hopping around squares on a pyramid, chased by a snake. As tradition now has it, Max's sole aim is to change the colour of the squares. The snake's aim is directed solely at Max, who loses one of his nine lives if their paths collide.

Unfortunately, Max looks more like a boiled egg and the snake looks like a lollipop on legs. And the game itself looks suspiciously like another Q-Bert clone.

That said, it gets pretty difficult if you've managed to muster enough enthusiasm to stick with it. The snake gets nastier and squares revert back to their original colour if Max lands on them twice. Difficulty apart, sound and graphics are pretty rudimentary. One nice feature is that you can change screen and border colours, but only at the beginning of the game. All in all, pretty mediocre stuff. *BB*

Anirog

Presentation:	■■□□□
Skill level:	■■■□□
Interest:	■■□□□
Value for money:	■■□□□



BRAIN PAIN
Vic-20 (unexpanded)
Joystick or keyboard
Price n/a

The game that forces you to think! In this excellent version of the family game of *Pairs*, up to six players can have a riotous time, or you can play on your own against the clock. Move the cursor to your chosen position using either joystick or keys, press the appropriate button to reveal the image, then move on to try and find its pair. The pain comes when trying to remember where the very one you want is hiding!

There is also an edit facility for you to change any of the pictures and create your own. Great fun for the family, and very impressive for the unexpanded Vic-20. *WG*

MicroAntics

Presentation:	■■■■■
Skill level:	■■□□□
Interest:	■■■■□
Value for money:	■■■■■



ASTRO FIGHTERS
Vic-20 (unexpanded)
Joystick and keyboard
Price £4.90

This space duel is one of the very few games that is two-player only – one uses the joystick, the other the keyboard. Each player is the pilot of an Astro Fighter, whose task is to destroy his opponent's ship whilst avoiding some of the random dangers around his fighter craft.



This is a very simple game, with poor sound and poor graphics. There is precious little to say about it and not much more to say for it.

Sumlock Electronics *WG*

Presentation:	■■■□□
Skill level:	■■□□□
Interest:	■□□□□
Value for money:	■□□□□

STARSHIP ESCAPE
Vic-20 (+16K)
Joystick or keyboard
Price £6.90

According to the cassette blurb, this is "a compelling and exciting real time graphic space adventure game" – and they're right – it is!

You are a lonely little pilot of a Federation scout ship, travelling through an unknown sector of the galaxy, when you come upon a gigantic starship which proceeds to draw your craft into its cavernous interior. Your craft is then disassembled and the parts distributed in various rooms about the ship.

Your unenviable task is to search each room for the parts, overcoming the dangers that await you, and bring each part back, one at a time, to the airlock. When you have retrieved all the parts of your craft, you then have to re-assemble the ship and make your escape.

That megatask is not made easier by the alien occupants whose chief role in life is to catch you and return you to the airlock. The starship is in the malevolent power of the Force Cloud Entity (second cousin to the Editor), whose purpose is unknown to the human race (again somewhat like our Editor!) except that they capture any earthship in their path and imprison its occupants.

Your attempts to collect the parts of your ship are made harder because the Force Cloud may appear at random just as you are about to collect a part from a room. If you're not quick enough it may take your part away from you; or worse still, catch you and put you back in the airlock. It cannot be killed so you have to manoeuver out of its way.

But you do have a faithful companion curiously called K9. He helps to attract aliens away from you, so that you can get on with the business of collecting the bits of your space ship. He will disappear when you leave the room to lose himself again in the ship. To find him, and to show you where you are, there's a Map/Time Stop facility which shows you and your K9's position. In all, good value for money, and should keep you occupied until well past your bedtime. *WG*

Sumlock Electronics

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■■■□
Value for money:	■■■■□



Games



Romik is bringing out such a lot of games for the Vic that it's decided to lump together four of its older offerings into a Bumper Pack, costing £13.98 – that's about half what you would have paid for them individually. We haven't reviewed the games before, so here's your chance to find out whether the pack really is a bumper bargain.

MARTIAN RAIDER
Vic-20 (unexpanded)
Joystick or keyboard

This is a spin-off from *Skramble*. No you don't get the whole course, there being four sectors to marauder through, blasting and zapping three different ground targets. Section one has you dextrously avoiding missiles; a change of colour scheme heralds the arrival of the cyan yo-yo saucers, accompanied by wobbly sonics; the wooshing noises will alert you to the purple meteor shower (they really should be indestructable); now we are over the yellow rocket city, still carefully picking off the fuel dumps to prolong our flight; end of the course and round we go again.

A colourful adaption of an arcade standard, well worth having if you don't own Anirog's 16K version. Good use of colour and sound.

SHARK ATTACK
Vic-20 (unexpanded)
Joystick or keyboard

Not unlike the superb *Stix*, for the 64, the idea of the game is to spread a yellow net over as much of the black screen as possible, at the same time curtailing the movement of four obstreperous cyan sharks. Dally too long and they will break from and disintegrate their bonds to lead you a merry dance. Succeed in occupying a sufficient area of the screen and up pops level two with a couple of green octopuses (octopii only to Latin speakers). They are not just for show: touch them and you loose a life. Each success will land you with two extra molluscs to work around. Now all that sounds like an unusual challenge to me, possibly spoilt for some by the background melody but if the worst comes to the worst you can always turn down the volume.

TIME DESTROYERS
Vic-20 (+8 or +16K)
Joystick or keyboard

Not the best *Defender* clone on the market but certainly action packed. Faults first: a slightly flickery protector craft and the scrolling/acceleration wasn't instantaneous.

There is no call to rescue humans, just deny the aliens the material they need in order to mutate. Three different combinations of opponents to choose from, but everyone will be most interested in the most complex level. Here you will compete with the likes of green landers, purple superdroids; the odd mother ship and white spider craft, which disgorge swarmers and blue horseshoe-magnets busily spreading space mines everywhere. Zap or be zapped, you've got your work cut out to survive in this arena.

MOONS OF JUPITER
Vic-20 (+3, +8 or +16K)
Joystick or keyboard

This game is graphically superb. But where do the sprite-like effects come from? My guess is that fast-alternating screens are employed to produce the illusion ... anyway, whatever tricks are used, the result is a success. Note also the lunar-style cratered surfaces of the asteroids, they of course need cutting down to size, three times in fact before they finally snuff it. UFOs slide in, accompanied by a whirring hum, to add complexity and extra targets. But don't expect to blast the Gologs; the most you can hope for is to lure them into debris by cunning movements of your rocket.

Three levels, each using different and spectacular colour combinations. If this game doesn't appeal ... there is just no pleasing you.

Now for the overall evaluation of the package. *LS*

Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■■■□
Value for money:	■■■■■

Spike

by S Johnson

This might be just the game for the Vic-20 owners who don't get on very well with spiders. The game runs happily on a Vic without expansion.

You're trapped in a room with one of these eight-legged creepy crawlies, a highly poisonous variety, according to the author. Your job is to attack it from above, and kill it using a spike which you manoeuver from the keyboard – manoeuverability is pretty good, too. Don't worry, the program itself contains all the necessary instructions.

To make matters more challenging, the spider spins a web as it moves near the walls. Touch any of the walls, the spider or its web and you lose a life. There are also nine levels of play (which govern the spider's speed as it blunders around) and a high score display which dictates the level.

This is quite a simple game with nothing startling in terms of graphics and sound. But it is original and pretty challenging at higher levels. Definitely more fun than keeping spiders in a matchbox.

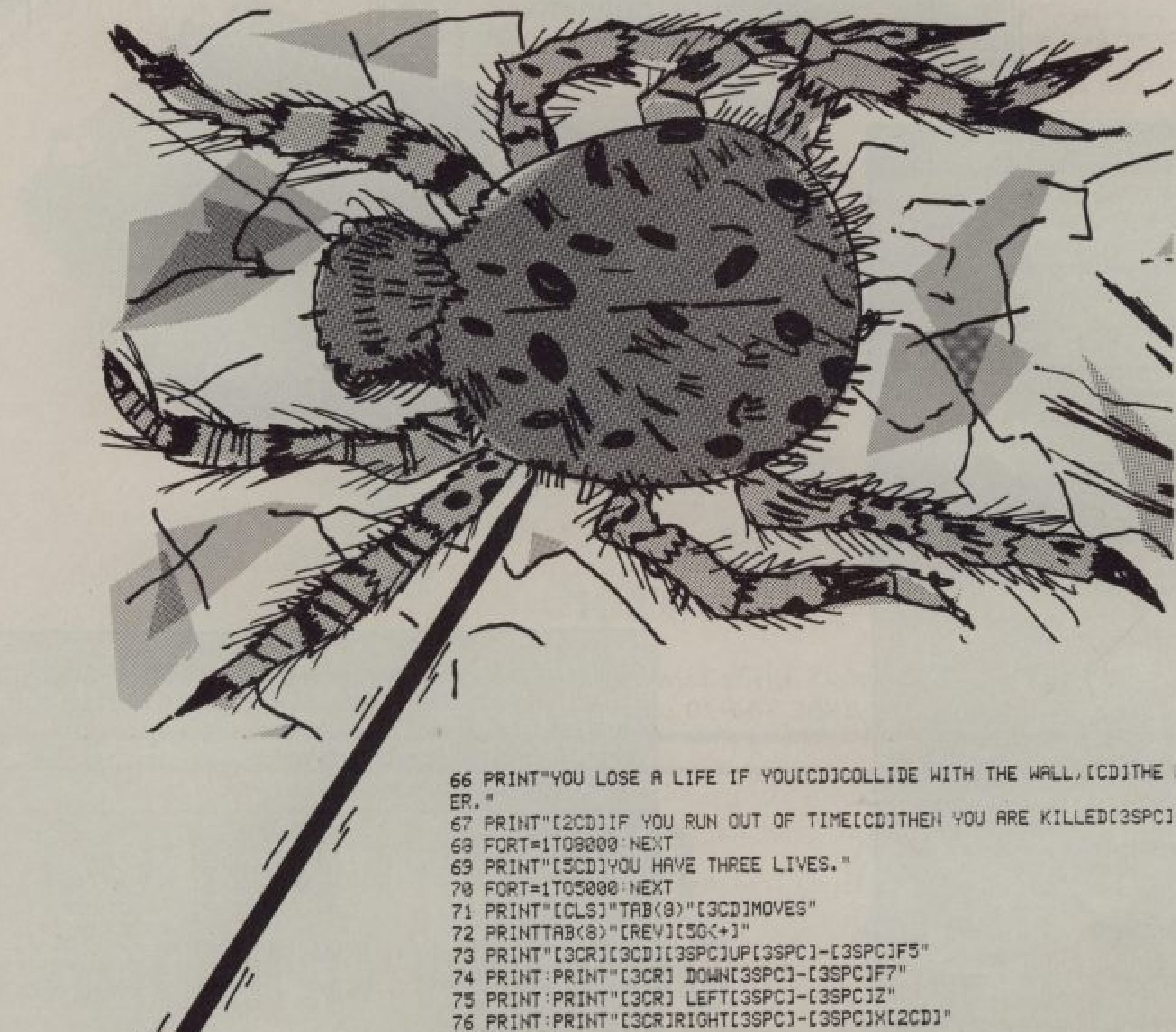
VARIABLES USED:-

A,DA –	attacker movement
V,VE,VR –	spider movement
CA –	attacker colour
CV –	spider colour
EX,W,Q,J,VH –	flags
LI	lives remaining
HS,SC –	high score, score
TL –	time limit
X1,X2,T,I –	loop counters
P,PA –	peek variables
L –	level
VO –	volume

HOW IT RUNS:-

Lines 1 - 3	initialises game
Lines 4 - 15	main program
Lines 16 - 28	spider movement
Lines 30 - 42	attacker movement
Lines 43 - 46	checks for collision
Lines 47 - 50	collision sound
Lines 51 - 59	lose routine
Lines 60 - 77	instructions
Lines 79 - 83	sets up graphics
Lines 84 - 87	sets level, turns sound on
Lines 88 - 94	sets up screen
Lines 96 - 107	win routine

```
1 PRINT"[CLS][5CR]PLEASE WAIT":GOTO79
2 GOSUB60:HS=0
3 LI=3:TL=600:SC=0:VH=0:EX=0:VO=36878
4 GOTO84
5 A=8139:V=7840:CA=38859:CV=38560
6 POKEA,27:POKECA,2:POKEV,28:POKECV,3
7 TL=TL-1:IFTL/10<>INT(TL/10)THEN9
8 PRINT"[HOM]";TL/10;"[CL] "
9 IFTL<1THENPRINT"[CLS]":GOTO53
10 GOSUB16
11 IFVH=1THEN47
12 GOSUB30
13 IFW=1THEN96
14 IFEX=1THEN47
15 GOTO6
16 IFV>8163THENVE=-VE
17 VH=0:Q=32
18 IFRND(0)>L/10THEN27
19 VR=INT(RND(0)*2):IFVR=0THENVR=-1
20 VE=INT(RND(0)*6)+21:IFVE>23THENVE=1
21 VE=VE*VR:IFPEEK(V+VE)<>32THENGOSUB43
22 IFV<7725ANDVE<-20THENRETURN
23 IFVH=0THEN26
24 IFVH=1THENRETURN
25 IFQ=255THEN28
26 POKEV+VE,28:POKECV+VE,3:POKEV,Q:V=V+VE:CV=CV+VE:POKE36876,225:POKE36876,0
27 VM=VM+1:IFVM=5THENVM=0
28 RETURN
30 J=0:P=PEEK(197)
31 IFP=64THENRETURN
32 IFP=33THENDA=-1
33 IFP=26THENDA=1
34 IFP=55THENDA=-22
35 IFP=63THENDA=22:J=1
36 PA=PEEK(A+DA):IFPA=32THEN39
37 IFPA=28ANDJ=1THENW=1:RETURN
38 IFPA>27THENEX=1:RETURN
39 POKEA+DA,27:POKEDA+CA,2:POKEA,32:POKE36875,220:POKE36875,0
40 A=A+DA:CA=CA+DA
42 RETURN
43 VH=0
44 IFPEEK(V+VE)=255ORPEEK(V+VE)=29THENVE=-VE:Q=29:RETURN
46 VH=1:RETURN
47 FORX1=0TO20:FORX2=0TO7:POKEA,20+X2:POKECA,X2:POKEVO-1,128+(18*X2)
48 NEXTX2,X1
49 POKECA,2:POKEVO-1,0
50 FORT=1TO500:NEXT
51 LI=LI-1:IFLI<>0THENVH=0:EX=0:POKEA,32:POKEV,32:A=8139:V=7840:GOTO4
52 PRINT"[CLS]"
53 PRINT"HARD LUCK - YOU LOST!":PRINT"[2CD][4CR]HIGH SCORE"HS
54 PRINT"[4CD][2CR]ANOTHER GO? (Y/N)[2CD]"
55 GETA$:IFA$=""THEN55
56 IFA$="N"THENPOKE36869,240:POKE36879,27:PRINT"[CLS]":END
57 IFA$="Y"THENLI=3:W=0:POKEA,32:POKEV,32:A=8139:V=7840:GOTO3
58 GOTO55
60 PRINT"[CLS][2CD]"TAB(7)"[GRN]SPIKE [RED]!!"
61 PRINTTAB(7)"[BLK][REV][8G<I][BLU]"
62 PRINT"[4CD]"
63 PRINT"YOU MUST DROP ON THE[2SPC][CD]SPIDER FROM ABOVE,[4SPC][CD]IMPALING HIM
ON YOUR[2SPC][CD]SPIKE.
64 FORT=1TO8000:NEXT
65 PRINT"[CLS][2CD]"
```



```
66 PRINT"YOU LOSE A LIFE IF YOU[CD]COLLIDE WITH THE WALL,[CD]THE WEB OR THE SPID
ER."
67 PRINT"[2CD]IF YOU RUN OUT OF TIME[CD]THEN YOU ARE KILLED[3SPC][CD]INSTANTLY."
68 FORT=1TO8000:NEXT
69 PRINT"[5CD]YOU HAVE THREE LIVES."
70 FORT=1TO5000:NEXT
71 PRINT"[CLS]"TAB(8)"[3CD]MOVES"
72 PRINTTAB(8)"[REV][5G<+]"
73 PRINT"[3CR][3CD][3SPC]UP[3SPC]-[3SPC]F5"
74 PRINT:PRINT"[3CR] DOWN[3SPC]-[3SPC]F7"
75 PRINT:PRINT"[3CR] LEFT[3SPC]-[3SPC]Z"
76 PRINT:PRINT"[3CR]RIGHT[3SPC]-[3SPC]X[2CD]"
77 RETURN
79 POKE36869,255:POKE56,28:POKE52,28:CLR
80 FORI=7168TO7679:POKEI,PEEK(I+25600):NEXT
81 FORI=7384TO7407:READA:POKEI,A:NEXT
83 GOTO2
84 IFLI<>3THEN87
85 INPUT"[2CR]WHICH LEVEL(1-9)";L
86 IFL<1ORL>9THEN85
87 POKEVO+1,253:POKEVO,15:PRINT"[CLS]"
88 FORI=7702TO7724:POKEI,255:NEXT:FORI=8164TO8185:POKEI,255:NEXT
89 FORI=7702TO8164STEP22:POKEI,255:NEXT:FORI=7723TO8185STEP22:POKEI,255:NEXT
90 FORI=38422TO38905:IFPEEK(I-30720)>32THENPOKEI,4:POKEVO-3,200:POKEVO-3,0
91 NEXTI
92 PRINT"[HOM][CD][3CL]";:FORPL=1TOLI:PRINT"[";:NEXT
93 POKEA,27:POKECA,2:POKEV,28:POKECV,3
94 GOTO5
96 POKEA,27
97 FORX1=0TO4:FORX2=128TO200:POKEVO-2,X2:NEXTX2:POKECA,6:FORX2=128TO200:POKEVO-2
,X2
98 NEXTX2:POKECA,3:NEXTX1:POKEVO-2,0
99 POKECA,2:FORT=1TO3000:NEXT
100 PRINT"[CLS][2CD][6CR]WELL DONE!"
101 SC=INT(L*LI*TL/10)
102 PRINT"[2CD][4CR]YOU SCORED"SC
103 PRINT"[2CD]"
104 IFSC>HSTHENHS=SC:PRINT"NEW ";
105 PRINT"HIGH SCORE"HS
106 FORT=1TO2000:NEXT
107 GOTO54
108 DATA255,219,219,126,60,24,24,24
109 DATA165,153,90,60,24,102,153,165
110 DATA129,66,60,36,36,60,66,129

READY.
```

How to type in Victuals

How we reproduce listings

We have two methods of presenting listings. When we can, we run them through a converter program that replaces the hieroglyphic control codes with more meaningful symbols.

When you see...	It means ...	And you ...
[CU]	cursor up	press the 'cursor up' key (shifted)
[CD]	cursor down	press the 'cursor down' key
[CL]	cursor left	press the 'cursor left' key (shifted)
[CR]	cursor right	press the 'cursor right' key
[HOM]	cursor to the top lefthand corner	press the HOME key
[CLS]	clear	press the CLR key (shifted)
[DEF]	insert	press the INSert key (shifted)
[BLK]	change to black	press the BLK key (CTRL and 1)
[WHT]	change to white	press the WHT key (CTRL and 2)
[RED]	change to red	press the RED key (CTRL and 3)
[CYN]	change to cyan	press the CYN key (CTRL and 4)
[PUR]	change to purple	press the PUR key (CTRL and 5)
[GRN]	change to green	press the GRN key (CTRL and 6)
[BLU]	change to blue	press the BLU key (CTRL and 7)
[YEL]	change to yellow	press the YEL key (CTRL and 8)
[REV]	reverse on	press the RVS ON key (CTRL and 9)
[OFF]	reverse off	press the RVS OFF key (CTRL and 0)
[SPC]	space	press the space bar; repeat the specified number of times

[G<key]	**press specified key together with CBM key**
[G>key]	**press specified key together with SHIFT key**

When you see any of these codes prefixed by a number, you must press the appropriate key the same number of times:

for example: **[3SPC]** means – press the spacebar three times
or
[5CD] means – press the 'cursor down' key five times

These listings we generally run out on a letter-quality printer, though, and conventional graphics can't be handled on a daisywheel. So some listings are done on a Commodore printer, in which case you may see the standard control codes:

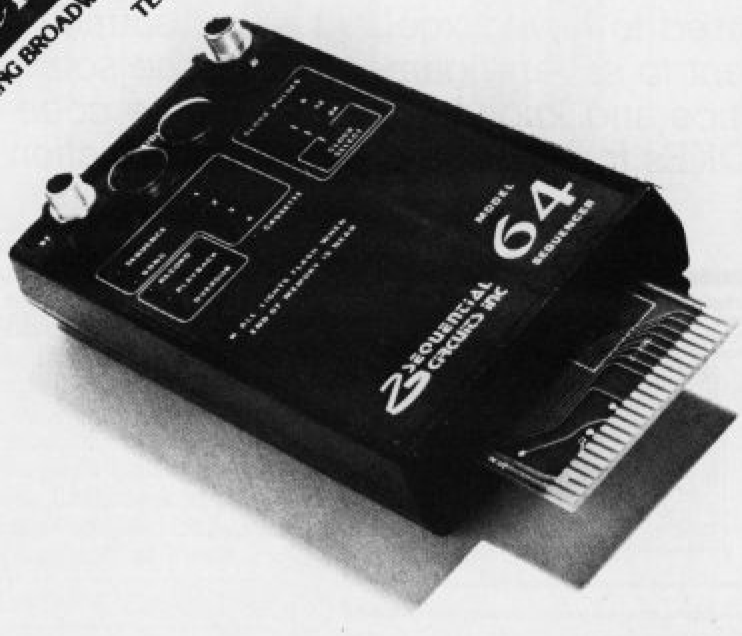
```
CLR          ...    (REVERSED HEART)
HOME         ...    (REVERSED S)
RVS ON       ...    (REVERSED R)
RVS OFF      ...    (REVERSED UNDERSCORE)
CURSOR UP    ...    (REVERSED SHIFTED •)
CURSOR DOWN  ...    (REVERSED Q)
CURSOR LEFT  ...    (REVERSED UPWARD BAR - SHIFTED H)
CURSOR RIGHT ...    (REVERSED LEFT SQUARE BRACKET)

SET COLOUR TO
        BLACK  ...  (REVERSED SHIFTED P)
        WHITE  ...  (REVERSED E)
        RED    ...  (REVERSED £)
        CYAN   ...  (REVERSED COMMODORE-SHIFTED •)
        PURPLE ...  (REVERSED COMMODORE-SHIFTED -)
        GREEN  ...  (REVERSED UP ARROW)
        BLUE   ...  (REVERSED LEFT ARROW)
        YELLOW ...  (REVERSED PI SIGN)
THE FUNCTION KEYS CAN BE INCORPORATED INTO PRINT STATEMENTS TOO.
AS WITH THE OTHER NON-ALPHANUMERIC KEYS, THEY APPEAR AS SPECIAL"

SYMBOLS IN A LISTING
F1  ...               F2  ...
F3  ...               F4  ...
F5  ...               F6  ...
F7  ...               F8  ...
```

CHROMATIX
EALING BROADWAY CENTRE, OAK ROAD, LONDON W5
TEL 01-567 3623

WHAT'S THE MIDI?



If you are serious about using your computer to make music then you need a serious musical instrument.

In 1982 the major electronic instrument manufacturers got together and agreed to adopt a universal system enabling devices to talk to one another – M.I.D.I., the musical instrument digital interface.

This new industry standard enables you to control professional musical instruments directly from your computer.

Sequential Circuits Inc are pioneers in this new technology and have developed a special cartridge that plugs into a Commodore 64. You can then connect any M.I.D.I. based instrument to your Commodore and use it to create multi-track recordings etc. The equipment enables you to perform such functions as "track bouncing", and "mix-down" – techniques utilised in professional recording studios.

We are **CHROMATIX** – one of the country's leading electronic musical instrument stores. **CHROMATIX** is jointly run by David Crombie – author of "The Complete Synthesiser" and "The Electronic Keyboard and Synthesiser Handbook"; and Howard Brain – one of the industry's best known figures. Our experience gives us an insight into what is best in the musical instrument world, so come and visit us in our new West London store, and hear your computer make sounds like you've never heard before.

CHROMATIX

CHROMATIX: Ealing Broadway Centre, Oak Road, London W5.
Telephone: 01-567 3623

DO YOU HOVVER AROUND WAITING FOR BASIC?



DTL BASIC 64

Jetpack is a Basic Compiler for the CBM 64. It converts a Basic Program into Pseudo Machine Code which runs much faster and is smaller, leaving more RAM for you.

*100% compatible with C.B.M. Basic *Compiled programs may run up to 25 times faster *A fast automatic garbage collection routine is included *Uses existing machine code routines without alteration *Can compile extensions to Basic *Compresses program making it easier to load *Handles both floating point and integer arithmetic *Full syntax error checking while compiling *Cross references and checks all GOSUB and GOTO'S *Contains a cross indexing error locate program for use if your program crashes whilst running.

D.T.L. Basic 'Jetpack' is available on tape or disc.

Tape Version . . . £14.95 Inc. Vat. Disc Version . . . £39.95 Inc. Vat.

Note: The tape version is restricted to compiling a maximum 12K program.

USE D.T.L. BASIC 64 Jetpack **... IT'S A LOT LESS BOVVER!!**

Available from all good computer retailers or direct.

PRIORITY MAIL ORDER

Please send me:
Further information ☐ Jetpack tape ☐ Jetpack disc ☐

I enclose Cheque/Postal Order for £.................... (please add £1 for p & p)
OR. I wish to pay by ACCESS/VISA

NAME .... Card No. ....
ADDRESS .... Card holders
.... Signature ....

**To DATAVIEW WORDCRAFT LTD.
RADIX HOUSE, EAST STREET,
COLCHESTER, ESSEX, TEL: (0206) 869414** CUS

FRED on Sound

Why did I choose the Commodore 64 out of all the other micros on sale a year ago? One of the reasons was that the 64 was rumoured to have excellent music/sound capabilities; and judging by the accompaniment to several games I have the sources were right. But it seems anyone without patience and knowledge of machine code is likely to be pretty browned-off with all the POKEs involved, the lack of information available, and the limitations of Basic!

The heart of the 64's sound system is it's SID chip (SID stands for 'Sound Interface Device'), and the chip is directly controlled by registers set up in the computer's memory. These registers are located from 54272 (D400 hex), to 55295 (D7FF hex).

Synthesis of a synthesiser

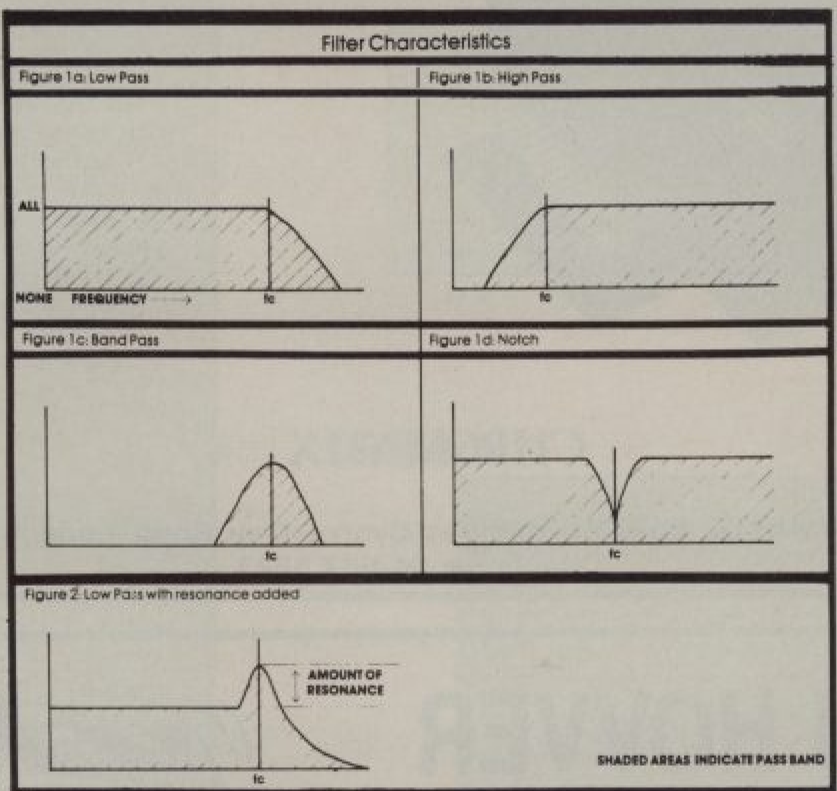
A synthesiser consists of three basic blocks – namely Source, Treatment and Control. The 64's sources are three 'voices', each working independently of the others to provide the 'raw' sounds and noises for the Treatment section.

Each voice consists of four different sounds, any of which can be enabled individually or in combination (the science of adding different sounds together is known as 'additive synthesis'). And of course each voice can play any of 65,535 pitches spread over a range of eight octaves – an octave is a 'doubling' in pitch.

The Treatment section comprises a filter, a ring-modulator – also known as a 'four-quadrant multiplier' – and a facility for synchronizing voices. Of these, the most useful item is the filter.

The 64's filter can operate in three different modes; *low pass*, *high pass* and *band pass*. In low pass mode, the filter will progressively reject all sounds above the cut-off frequency (as set in registers 54293 and 54294, D416 and D417 hex). In other words, in low pass mode the filter will only pass low sounds. In high pass mode, of course, only high frequencies are passed and all other sounds are rejected. Selecting band pass mode will reject both low and high frequencies, and pass only sounds close to the cut-off frequency (known as *the centre frequency*). For those of you who understand such matters, the filter has a 12dB per octave rolloff.

This is not the end of the story though; by selecting both low pass and high pass, we have a fourth mode known as the notch or band reject mode, see figure 1. A fifth mode also exists, although SID makes no provision for it, known as no pass or phase shift.



Resonance

One of the most important functions of a filter is to provide resonance. The high four bits of the register at 54295 ($D417 hex) control the resonance of the filter (the lower four bits control which voices are fed through the filter). Resonance acts to boost the frequencies just before the cutoff or centre frequency (see figure 2). This gives you the ability to closely emulate the natural resonances of real sounds.

For example, oboes and bassoons have a strong resonance that emphasises the first and second harmonics. It is this resonance, largely due to their physical construction (wooden tubes), that gives them such a distinct tone. A flute or piano, on the other hand, has most of its natural resonance 'designed out' to make very pure sounds, and their inherent character is due to other factors – largely their amplitude envelope.

The ring modulation function is normally only found on expensive synthesisers, and unlike other forms of treatment is derived purely mathematically. Consider a ring modulator as a 'black box', with two inputs and one output. The box determines the frequency of each input, and performs the following calculation to produce the output **fo=(f1+f2)** and **(f1−f2)**. Let's take an example: take an input waveform, say a sine wave (a sine wave contains only one frequency – it's fundamental), at a frequency of 300Hz, and a second input, the same shape but a frequency of 100Hz. Using our formula **fo**, the output waveform contains frequencies of (300+100) and (300−100) = 400Hz and 200Hz.

As you can see, we now have two outputs mixed together, coincidentally an octave apart. Using the facilities offered by SID, the nearest we can get to a pure sine wave, is a triangle wave. Triangle waves contain not just their fundamental frequency, but a few higher frequencies called harmonics. The ring modulator performs its calculation on *all* the input frequencies, not just the fundamental. This means the output waveform will be a lot more complex than either of the two inputs. Imagine the result of a sawtooth modulated with a square (pulse) wave!

If you are careful, some excellent bell-like sounds can be produced by this method.

The ADSR envelope

In the world of natural sounds, a note does not sound the same through its duration: certain important factors change with time. For example, a note played by drawing a bow across a violin string will build in volume quite slowly, hold its maximum volume for as long as the bow continues to move, and then quickly die away.

A note played on the piano, on the other hand, will reach its maximum volume quite quickly, then fall off slowly until the key is released and it's finally cut off completely by the damper.

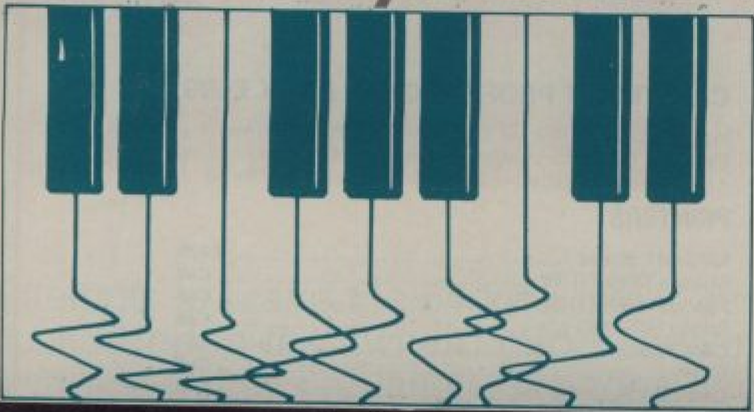
The four 'phases' of a note are called Attack, Decay, Sustain and Release (the whole concept is often known as 'ADSR' or 'envelope') and these parameters can be used to control volume, tone and other effects throughout the duration of a note. On the 64, each voice has its own 'envelope generator' of the ADSR type, set up to control the volume of that voice. This envelope can also be used to control the filter and certain other functions.

All in all you haven't a hope of trying to control all these things by yourself; so Commodore provides a computer to control everything for you! To write a program to accomplish all this, to turn the art of making music from a pennance to a pleasure, is surely a job for a professional programmer ... unless you have a package to help you.

Next month, Fred will be Looking at three commercially available synthesiser packages for the 64: Synthy 64 from Abacus, Ultisynth from Quicksilva and Romik's Multisound Synthesiser. Stay tuned.

What's a synthesiser?

by Fred Reid



The SID map

Decimal	Hex	bits	Function
54272	D400		Voice 1: Frequency, low byte
54273	D401		Voice 1: Frequency, high byte
54274	D402		Voice 1: pulse width, low byte
54275	D403	7–4	unused
		3–0	Voice 1: pulse width, high nybble
54276	D404		Voice 1: control register
		7	Noise: 1 = on
		6	Pulse:1 = on
		5	Sawtooth: 1 = on
		4	Triangle 1 = on
		3	Test bit: 1 = disable voice 1
		2	Ring modulate voice 1 with voice 3: 1 = on
		1	Synchronize voice 1 with voice 3: 1 = on
		0	Gate bit: 1 = start attack, 0 = start release
54277	D405		Envelope generator 1: attack/decay
		7–4	Attack cycle duration: 0 to 15
		3–0	Decay cycle duration: 0 to 15
54278	D406		Envelope generator 1: sustain/release
		7–4	Sustain level: 0 to 15
		3–0	Release cycle: 0 to 15
54293	D415	7–3	Unused
		2–0	Filter cutoff frequency: low nybble
54294	D416		Filter cutoff frequency: high byte
54295	D417		Filter resonance/input select
		7–4	Filter resonance: 0 to 15
		3	Filter external input: 1 = yes
		2	Filter voice 3: 1 = yes
		1	Filter voice 2: 1 = yes
		0	Filter voice 1: 1 = yes
54296	D418		Filter mode and volume
		7	Disable voice 3 output: 1 = yes
		6	High pass mode: 1 = on
		5	Band pass mode: 1 = on
		4	Low pass mode: 1 = on
		3–0	Output volume: 0 to 15
54299	D41B		Oscillator 3: random number generator
54300	D41C		Envelope generator 3: output

Voice 2 and 3 registers are the same as voice 1, add 7 to the address for voice 2, and add 14 for voice 3.

A glossary of synth terms

AMPLITUDE: the magnitude or volume of a wave.

ATTACK: the first time-phase of a note, normally measured in milliseconds.

BANDPASS: a type of filter, passing only frequencies near its center frequency.

CUTOFF: the frequency at which a filter stops passing sound.

D/A: digital to analogue converter – enables digital equipment (like computers) to control non-digital equipment.

DECAY: the second time-phase of a note, normally measured in milliseconds.

DYNAMICS: the difference between quiet and loud, the range of volume or effect.

ENVELOPE: a graph of a particular quality of a sound, plotted against time.

FILTER: a device that progressively acts to remove sounds outside its pass band.

FREQUENCY: literally, the number of times a waveform repeats itself. Normally measured in Hertz (repetitions per second).

FREQUENCY MODULATION: an effect whereby the amplitude of one waveform acts upon the frequency of another.

FUNDAMENTAL: usually the lowest frequency found in a complex sound, or the lowest note in a chord – the 'base' note.

GATE: a signal kept 'high' (or 'on'), while a note is being played (see SUSTAIN).

HARMONIC: a higher note added to the fundamental, giving the note character.

HIGHPASS: a filter that acts progressively on sounds below it's cutoff frequency.

LOWPASS: a filter that acts progressively on sounds above its cutoff frequency – the most common filter type.

MODULATION: the technique of 'affecting' one function with another.

NOTCH: a type of filter whose pass-band is either inside of its center frequency. Useful for removing persistent hums and buzzes.

OCTAVE: the range in which a musical note is placed. Technically. moving an octave up is the same as doubling the frequency of the note.

OSCILATOR: a device that produces waveform. Also known as 'tone generator'.

PITCH: same as FREQUENCY. The higher the pitch, the higher the note.

PORTAMENTO: this means a smooth glide between two notes, usually done automatically.

PULSE: either a single on/off cycle used for control purposes, or a chain of pulses known as a pulse wave.

PULSE WIDTH: the ratio of 'on' to 'off' period in a pulse or pulse wave.

RELEASE: the final time phase in a sound, normally following the end of the gated period.

RESONANCE: the amount of 'lift' given to a filter at its cutoff frequency. A vital part of synthesis.

RING MODULATION: a purely mathematical function producing an output equal to the sum and difference of the two input frequencies. Useful for 'bell' sounds.

SAWTOOTH: a wave shape containing all harmonics in a certain proportion. Sounds like its name.

SINE: (sinusoidal) the most natural and pure sound of all. Contains no harmonics.

SQUARE: a wave shape containing only odd harmonics (1st, 3rd, 5th etc), similar to pulse wave but of fixed on/off ratio (ie 'square').

SUSTAIN: the third time phase of a note, usually expressed as a level maintained during that phase.

SYNCH: Synchronisation – a technique in which two notes are combined without altering their pitch.

TIMBRE: the tonal quality of a sound, affecting its character.

TRIANGLE: yet another wave shape – similar to a sine wave, but with more harmonics. Sounds 'flutey'.

VCA: Voltage-Controlled Amplifier – a hangover from the days of Dr. Robert Moog. Normally referred to now as 'ADSR'.

VCO: Voltage-Controlled Oscillator – another hangover from yesteryear, see OSCILLATOR.

WAVEFORM: a regularly repeating sequence of shapes, normally plotted as a graph of amplitude against time.

WAVELENGTH: the physical length of a sound wave, normally measured in metres.

SUPERIOR database

Superbase reviewed

by Karl Dallas

Attempts to make the 64 look like a 'real' business computer have sometimes floundered in the awkard gap between a marketing person's imagination and the software-writer's abilities. The idea of using the 64 to create, maintain and retrieve files is great: the practice is such that most so-called 'database' packages for the 64 are slow, memory-hungry and (above all) restricted.

As its immodest name implies, Superbase claims to be somewhat different – a 'professional' package for the 64 that aims to compare favourably with anything available on larger, faster and more expensive computers.

It is well-reported, and it is selling well too. We thought it was about time we checked out the claims...

Make no mistake about it, Superbase 64 is an extremely sophisticated disk-based information management system. The number of individual databases, records in a file, key lists, memo files (including help screens) and 4K applications programs possible is limited only by the size of your disk. So anyone using 8250 disk drives via an Interpod or some other IEEE interface would find it more powerful still than someone limited to the plodding 1541.

Superbasics

Each database can handle up to 15 different linked files – making it possible, for instance, to link a file of customers' names and addresses with an invoices file, so that it's not necessary to keep more than the customer's name on the latter. Three files can be held in memory at a time and any two can be linked (the link can be reversed with an ELINK command).

Each record can contain up to 127 fields, 32 of which can be either calendar, result or constant fields. The record can be spread across up to four screens. The maximum length of a text field is 255 characters; key and constant fields are limited to 30 characters. Numerical fields can be up to nine digits with up to four decimal places, plus one sign character (+ or −). Date and calendar fields may be expressed as either seven or nine-characters, with three-letter month designation coming either first or second. The case of the month designation (ie capital or small letters) is not significant, so that it will accept either Jun2484, 24Jun84, 24jun1984 or 24jUN84. Impressive, no?

The built-in applications programming language contained in the system is also good. It uses 21 of the common Basic commands and 19 common functions, plus 50 special Superbase commands (see the table). Superbase programs are limited to 4K in length – though chaining is possible – and they are held as sequential files. They can be RUN only from Superbase.

In addition to the help screens supplied, which can be edited by the user, it is possible to set up user-defined help screens for use with specific applications.

Only one key field is possible in any field. But by use of the MATCH command it is possible to perform a search based on any field. Duplicate keys are possible; but that's likely to create confusion when reading files, so they're probably best avoided.

The program contains a useful report generator, which can also be used for writing the simpler applications programs.

Six different printer definitions are available; you get programmable parameters for baud rate, data word length and number of stop bits (the default value is for a CBM dot matrix printer). Left and right margins, paper length, text length, line feed on/off, line speeds or continuous print can also be selected.

Installation

The program comes on a single system disk (in duplicate, since back-up copying is impossible) with a very imposing manual. That consists of a 52-page tutorial, an 81-page reference section, and a 32-page programmers' guide – sketchier than it seems, since fully 24 pages are devoted to the commands. There is a lot of programming information within the tutorial, however.

The appendices include details of the system values, data storage, file manager, listing of the start-up program (which can be modified by the user), a five-page explanation of the program's special error messages, RS232C control registers, and six pages of glossary.

Early versions had no index to the manual, but this has now been rectified with a fairly good seven-page offering. The Superbase part of the Superoffice manual, reviewed below, is however unindexed.

The program is LOADed with the command...

LOAD "SB",8,1

and then the screen displays the usual Precision multi-colour preliminary sequence for about two minutes – until it clears, goes grey, and displays the message:

REMOVE PROGRAM DISK
INSERT DATA DISK AND PRESS RETURN
OR
PRESS F1 TO CREATE DATA DISK

A data disk containing the start-up program, help files and a tutorial database called TRAINING will be created if F1 is pressed – re-formatting and erasing any data on the disk in the process. Just in case you have pressed the wrong key, the program forgivingly advises you that...

ALL DATA ON DRIVE 0 WILL BE DESTROYED
ARE YOU SURE?

Even if you have a twin-disk drive, this is done in a laborious single-disk manner. First the disk is formatted; then you're advised to insert the source disk, loading the data into memory. Now you are told to insert the destination disk and repeat the process: total time taken, including formatting, is about 5½ minutes...

After setting up the new data disk, the system shuts down and you have to reLOAD Superbase once more.

Booting a ready-prepared data disk takes about 20 seconds in comparison. Again, there is no provision with twin-disks for inserting system disk in drive 0 and data disk in drive 1, and booting automatically.

Getting started

Unless you change it, the start-up program loads the TRAINING database and offers you a choice of two files called CUST. REC and CUST.INV for the quite useful invoicing application which is contained in the second part of the Tutorial.

Before you get that far, however, the manual teaches you first how to set up a simple names-and-address database. That includes such interesting low-res graphics devices as 'inverting' (reversing) a line (or the whole screen) to highlight certain text: and using CTRL plus 1, 2 or 3 to change the screen colours (which are saved with

the screen format when you file it to disk). It doesn't seem possible to invert the field entry areas, which is a shame.

It's also possible to obtain an instructional audio cassette which takes the user through both these applications, for those of you who prefer the spoken word to the written.

This isn't bad. But rather irritatingly for those familiar with the 64, the cassette starts with a rather long-winded intro to the keyboard, system etc.

Using Superbase

Once a record format is defined, new records are created primarily through the ENTER option – this displays a clear record format on the screen for the operator to fill in.

An alternative method of adding records is available in the SELECT submenu. A 'browse' feature allows the user to flip through records backwards and forwards; to edit, replace or add records; or to enter any number of criteria to search for a particular record or set records.

Criteria for record matching may also be specified in the FIND option. The match may be defined as any text strings or numbers; in-field "and" and "or" combinations; in-field "greater than" and "less than" combinations; partial and sliding matches, within field or record. Multiple criteria may be entered, using the record format as a template. The whole operation is extremely easy.

Other key Superbase functions include BATCH, CALCulation, and SORTING. CALC is the main evaluation command: it can be used to change the contents of any type of field within records, obtain values in memory variables for totalling or other purposes, or as an instant calculator on the Superbase command line. BATCH is an easy way of applying the operations available in CALC across a file or set of records.

Instant applications

At this level Superbase is an extremely easy-to-use menu-driven program. And the provision of the new Homebase and Stepping Stones applications makes it even easier. Four 'Homebase' applications packages are available, priced at £17.95 each:

Homebase 1 includes Birthday File, Freezer File, Sports Results File

Homebase 2 offers Bookcase, Diet and Television files

Homebase 3 has Holiday, Hi-Fi (actually gramophone records) and Sportsstar files

Homebase 4 gives you Address, Gardening and Milkman files – but the way the address records are set up is slightly differently from that in the Tutorial.

Ten **Stepping Stones** packages at £9.99 include Cash Book, Sales Day Book, Purchase Day Book, Job Costing, Stock Records, Accountants Time Recording, Solicitors Time Recording, Club Membership, Estate Agents, and Travel Agents.

Surprisingly, these more professional disks come with no documentation (which perhaps explains the low price). But you do get very full help screens. I think this will change, because Precision tell me they have already received some adverse comment on the lack of written material – though of course the program makes it very easy to print out the help screens as a kind of instant manual.

All these applications can be edited by the user to customise them. Getting inside them is probably the handiest way of coming to grips with the Superbase programming language – which is what really makes the package so powerful.

Superbase programming

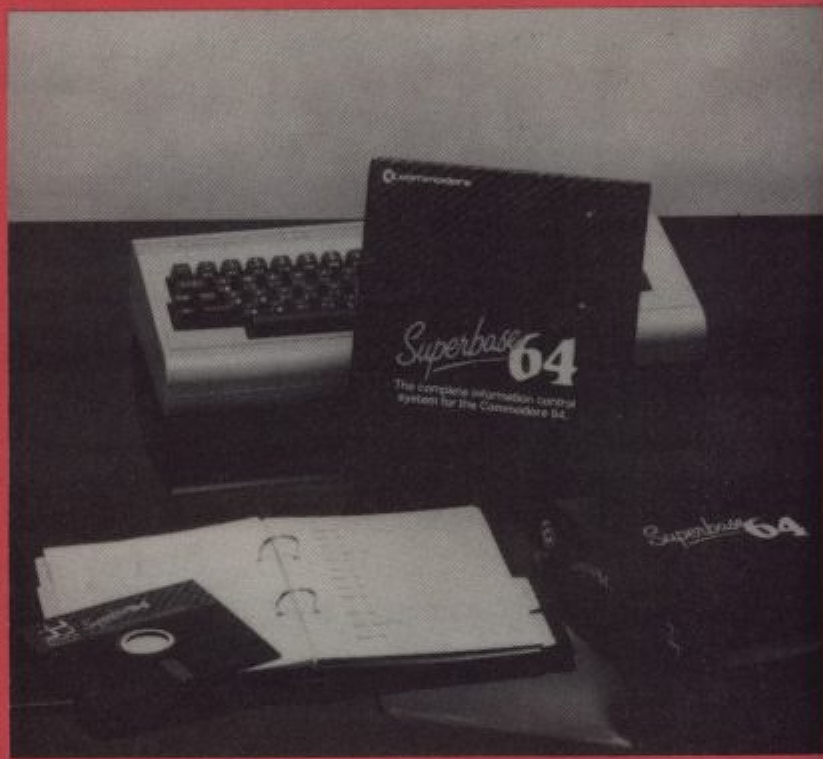
As I've said, anyone with any experience of computer use should find Superbase a doddle to use: it's all menu-based and almost impossible to crash. The worst that can happen is that you may get yourself into a record entry mode by accident, and have to enter a dummy record because until you've typed *something* into the key field it won't let you go anywhere else.

But if the data entry is to be handled by a non-computer person, or if the idea of developing applications packages for sale appeals to you, you *must* get into Superbase programming. It's as easy as Basic – and a *lot* easier than machine code or assembler.

The table (right) lists Basic commands that are recognised.

Some of these are self-explanatory. CONT has a different meaning from the identical Basic command; here it specifies continuous or discontinuous print.

SAVE and LOAD relate to sequential program files on disk, and no device number is



Basic-style commands in Superbase

CLR	GOTO	REM
DATA	IF ... THEN	RESTORE
DIM	LIST	RETURN
FOR ... NEXT	LOAD	RUN
END	NEW	SAVE
GET	ON	STEP
GOSUB	READ	STOP

Basic-style functions in Superbase

ABS	INT	RIGHT$
ASC	LEFT$	SIN
ATN	LEN	SQR
CHR$	LOG	STR$
COS	MID$	TAN
EXP	PI	VAL
FRE.		

Superbase Commands

ACROSS	EOF	QUIT
ALL	EOL	RESTART
ASK	FROM	RLINK
BRKOFF	IS	RMARG
BRKON	LFEED	SAVE
CLEAR	LINK	SCREEN
CONT	LMARG	SET
CONVERT	LOAD	SETLINK
DATABASE	MENU	SPACE
DATE	NMAT	STORE
DETAIL	PDEF	SUBTOTAL
DISPLAY	PDEV	TITLE
DO	PLEN	TLEN
DOWN	PLUS	TOTAL
DUMP	PMAT	WAIT
ELINK	PRINT	WHERE
ENDREPORT	PROTECT	

CHROMASONIC PERSONAL COMPUTERS

48 Junction Road, Archway, London N19 5RD
TEL: 01-263 9493 and 9495
238 Muswell Hill Broadway, London N10
01-883 3705

COMMODORE 64
PROFESSIONAL COMPUTER SYSTEM

Commodore 64
1541 Disk Drive
MPS-801 printer
Easy-script (word processor)
Easy-file (database)
Introduction to Basic (part 1)
Box of paper and box of disks

ONLY £599.00
P&P £14.00



SX64

PORTABLE COMPUTER
includes the following **FREE** software: Easy-script, Easy-file, Easy-finance and six games
ONLY £795.00 **P&P £22.00**

commodore 64

- e Commodore 64 .... £195.95
- c C2N cassette deck £39.10
- c Supersaver 64 cassette deck £29.95
- e 1541 disk drive £195.95
- f 1701 colour monitor £195.95
- e MPS-801 dot matrix printer £175.00
- f MPS-802 quality matrix printer £295.95
- d 1520 printer/plotter £149.95
- c RS232C (check for availability) £34.95
- c Z80 Card £50.00
- a Commodore joystick £6.90
- c Quickshot II joystick £10.50
- c Paddles (1 pair) £13.50
- a Microguide £5.95
- d Plinth for 64 system £24.95
- c Superbox 64 (inc. IEEE) £94.95
- d Vic switch £97.75
- c DAM's IEEE interface £69.95
- b Surge protector plug £12.95
- b Ramdisk 64 .... £129.95
- b Video 80 .... £89.95
- b Extender board for Ramdisk or Video 80 .... £8.50

64 PACKS

64 BEGINNERS PACK
Commodore 64
C2N cassette deck
ONLY £229.00
P&P £10.00

64 STARTER PACK
Commodore 64
C2N cassette deck
Intro to Basic (part I)
Quickshot joystick
A game of our choice
ONLY £255.00
P&P £10.00

64 HOME/BUSINESS PACK
Commodore 64
1541 disk drive
Box of disks
ONLY £395.00
P&P £12.00

MONITORS

- Commodore 1701 Colour & Sound £195.95
- Microvitec 1431 Colour (ideal for BBC) £228.85
- Microvitec 1431 AP RGB/Composite and Sound .. £258.95
- Phillips 12" Green £79.00
- Monitor plinth (c) £11.50

Postage on monitors £15.00

PRINTERS

- RX80 (Tractor only) Dot matrix £259.95
- RX80FT (Friction & Tractor) Dot matrix £299.95
- FX80 (Friction & pin feed) Dot matrix £399.95
- FX100 (Friction & pin feed) Dot matrix £545.95
- Daisy Step 2000 .... £329.95
- Juki Daisy Wheel £399.95
- BBC to Centronics cable (b) £11.95
- 64/Vic to Centronics cable (b) £19.95
- Software for above (b) £7.95

P&P on above unless otherwise stated (f)

MEDIA SUPPLIES

Diskettes by Verbatim (supplied in boxes of 10)

- b SS/DD 40Tr £17.95
- b DS/DD 80Tr £32.75
- b SS/DD 80Tr £24.75
- b Plastic library case . £1.35

b C15 cassettes **50p** each or 10 for **£4.50**

Computer paper (supplied in boxes of 2000 sheets)
d 11 x 8½ £13.00 d 11 x 9½ £12.65 d 11 x 15⅝ £15.52

PRINTER RIBBONS (postage code a)

- b Juki £1.85
- b MPS-801 .... £6.99
- b Epson £5.00
- b 1515/25 .... £6.21
- b MPS-802 .... £7.95
- b Daisystep 2000 .. £5.52

Dust Covers: (postage code b)

- BBC £2.95
- 64/Vic-20 .... £2.95
- C2N £1.95
- Single disk £2.95
- 1541 .... £1.95
- RX/FX80 .... £3.95
- Dual Disk £3.95
- 1525/GP100 .... £2.95
- FX100 .... £4.95
- 1526 .... £3.95
- Dragon £2.95

TERMS

Phone or send for our latest details of our range of products which is far too large to put into this advert. Besides the complete range of Commodore and BBC we also stock all the latest software and books for the 64, VIC, BBC and Dragon.

We guarantee all our products for 1 year (on 64 which is 2 years). Payment may be made by Access, Barclaycard, Bankers draft, Building Society cheque or cash. Sorry, cheques need 4 days clearance. Postage and packing: see codes. ALL PRICES ARE INCLUSIVE OF VAT.

WE RESERVE THE RIGHT TO ALTER PRICES WITHOUT PRIOR NOTICE

Postage codes: a=£0.65 b=£1.00 c=£2.00 d=£3.00 e=£8.00 (Securicor) f=£14.00 (Securicor) R=ROM C=Cassette D=Disk

BUSINESS

- b Easy Script D £69.00
- b Easy Spell D £50.00
- b Easy Stock D £75.00
- b Easy File D £50.00
- c Superbase 64 D £88.00
- b Sales Ledger D £75.00
- b Purchase Ledger D £75.00
- b Visa Write D £68.00
- b Calc Result Ca £49.95
- c Calc Result (Advanced) D £99.00
- c Wordcraft 40 Ca £89.95
- b Practicalc C/D £39.95/44.50
- b Practifile C/D £39.95/44.50

PROGRAMMING

- b Intro to Basic Part 1 or Part 2 C/D ... £14.50
- c Simons Basic Ca £45.00
- b Assembler Tutor C/D £29.95
- b Assembler Development Package D . £24.95
- c Petspeed D £50.00
- b Programmers Utilities D £14.99
- b LOGO D £34.95
- b MON 64 Ca £39.95
- b Acos + C £8.95
- b Forth 64 Ca £34.95

ADVENTURE STRATEGY

- b Zork I, II, or III D £11.99
- b Flight Simulator II D £35.95
- b Hulk C/D £9.95/13.95
- a Beach Head C £9.95
- a Valhalla C £14.95
- b Solo Flight C/D £14.95
- a Tales of the Arabian Nights C/D . £7.00/9.00
- b Colossus Chess C/D £9.95/12.95
- a Aztec Challenge C £8.95
- a Caverns of Kafta C £8.95

GAMES

- a Loco C £7.95
- a Flight Path 737 C £7.95
- b Bozo's Night Out C/D £6.90/9.99
- a Pinball Wizard C £6.95
- a International Soccer Ca £9.99
- a Revelation C £7.95
- a Forbidden Forest C £8.95
- a Trashman C £7.95
- a Bongo C £6.95
- b Space Pilot C/D £7.95/9.99
- b Zodiac C/D £7.95/9.99
- a Bumping Buggies C £6.99
- a Encounter C £9.95
- a Gilligan's Gold C £6.90
- a Manic Miner C £7.95
- a Hunchback C £6.90
- a Blagger C £7.95
- a Sheep in Space C £7.50
- a Aquanaut C £7.00
- b Superpipeline C/D £6.90/9.99
- a Son of Blagger C £7.95

EDUCATIONAL (by Sulis)

- b Beseiged C £9.99
- b Wordpower C £9.99
- b Time Traveller C £9.99
- b Open Sesame C £9.99
- b Just a Mot C £9.99

BOOKS

- c Programmers Reference Guide £9.95
- c 64 – Getting the Most From It £7.95
- c The Complete 64 Rom Disassembly . £5.95
- c Using the 64 .... £9.95
- c Commodore 64 Adventures £5.95
- c Elementary Commodore 64 .... £13.95

c = Cassette Ca = Cartridge D = Disk

The Superoffice combo

Superoffice claims to be "the ultimate Commodore Office Administration System". It is a combination of Superbase and Precision's Superscript II word processor on a single disk, allowing easy movement between the two programs without losing memory in either, and allowing access of Superbase data to the word processing part of the combination. It runs only on the now obsolescent 8096, the 700 series, and the new 8296 business machines (though it doesn't – yet – utilise the 128K memory within the 8296).

Actually, the user has two options on power-up. You can have either a combined Superbase/Superscript II, providing a 'short' text area of 132 lines of 80 characters; or a so-called 'long' Superscript (300 lines x 80 characters), with integral spelling checker including 30,000-word dictionary, but no Superbase. It's possible to move from 'short' Superscript to 'long' by typing in...

LOAD"0:SUPERSPELL"

... from the Superbase main menu. Moving in the opposite direction is not possible, however, without reLOADing the main program.

I give the combination only two cheers, mainly because some of the changes that have been made to Superscript. The original was a very friendly word processor: it could convert most other WP files to its own conventions, and since it stored its data as sequential files it was very easy to access them for use by other programs.

The new Superscript can still convert most other text files to its own format, even including the main formatting commands. But its own files are now much harder for another program to get into.

Also, Superscript and Easy Script had very similar commands, bearing in mind the different CBM machines they were intended for. Anyone familiar with them will have to start virtually over again to learn how to use Superscript II. If you're upgrading from one of the earlier versions, and had either Easy Spell or Superspell, your carefully built-up dictionary is now useless; and there seems to be no way of merging the old-style dictionary with the new one.

Whatever happened to upwards-compatibility, which always was such a feature of Commodore hardware and software?

The main thing I didn't like about Superscript II, however, was its slowness to react to the keyboard. I thought Wordcraft was slow enough, but there is a discernible delay between pressing a key and seeing its result appear on the screen. Not only is this slightly disconcerting, but it is actually possible to lose characters – especially double-letter combinations. "Travelling", for instance, is likely to come out as a Yankee-style "traveling", "kidnapper" as "kidnaper", etc.

Of course the spelling checker will catch such system-induced errors. But it's an unnecessary complication.

The manual is enormous: a two-inch thick A4 binder, containing a general introduction to both programs and an entire Superbase manual followed by an entire Superscript II manual. For some reason the Superbase has no index, which is bad news.

One improvement on this 96K version of Superbase is that setting up the data disk has a twin-drive option. But there's still no way of booting automatically from drive 0 to a data disk in drive 1.

Like Superbase 64, the system disk is uncopiable, which I think is a mistake. I know dongles cost a few bob; but they do allow the user to swap programs around various media, which one sometimes wants to do.

I gather that a future version may take advantage of the extra memory available in the 700 and 8296, probably by including the spelling checker in the 'short' option.

Superoffice costs £850.

needed. PROTECT makes it impossible to LIST or edit a program file.

Several of the commands can be abbreviated, like Commodore Basic keywords: "qU" is QUIT, for instance. And many can be used from within programs or in direct mode from the main menu; for instance, PRINT in direct mode will redirect all output to the printer until the DISPLAY command is typed. So **PRINT: LIST: DISPLAY** will list the current program to the printer and return to screen display after the LISTing is concluded.

Each command has at least half a page in the manual with programming examples: some get a whole page.

It's clear from the level of support Precision is planning, that the company sees Superbase as a major product; and I think they're right. They have established a hotline for users' enquiries (ring 01-330 7166 and ask for Brian Leefield), and there's talk of an independent users' group. Since I plan to use Superbase regularly, perhaps anyone interested in forming such a group, or interested in joining one, might like to drop me a line c/o **Commodore User**...

Last words

If ever proof were needed of the power and potential of the seemingly humble 64, this program provides it. Because it is one of the most powerful database packages on the market – more powerful than many written for its ostensibly bigger brothers in the CBM 8000 business class. For instance, it is available for the 8096 (and the new 8296) only in an £800 combination of Superbase and the Superscript II word processor, called Superoffice.

Of course, powerful packages often need powerful intellects to drive them; and you really need your wits about you to take the fullest advantage of everything that Superbase has to offer. Even then, for dummies like you and me Precision has put together a series of packages that take the new home or office user into the system with the minimum of trouble.

If you've got the impression that I am enthusiastic about Superbase, you'd be right. It's not cheap; but it's still better value for money than some of the cheaper so-called databases around. The programming language is an extremely interesting feature, enabling the programmer to produce really transparent data entry sequences for use by unskilled staff. But on the other hand, the tyro who stays within the menu system will find it quite easy to handle.

Verdict? On the plus side there's Superbase's ease of use, its documentation, the development potential, and those applications packages. Against it is the laborious single-drive set-up, even on double disk drives. Overall? Excellent!

Superbase in the States

Superbase 64 won the top Showcase Award in its category at the Consumer Electronics Show held during June in Chicago.

After a mere seven months on the US market, its sales there are running in excess of 3,000 units a month. This latest award in the highly competitive category of Innovative Personal Productivity Software is further evidence of the product's overall technical excellence and market appeal.

Peter Thomas of Precision Software (USA) commented "The Showcase Award is great news for Precision's credibility in the States: We've always been confident of Superbase's considerable merits and this award justifies our position as an emerging market force in the US Commodore software arena".

Under review	**Superbase 64**
Description:	**Database package with in-built programming language**
Supplier:	**Precision Software**
Address:	**Park House 4 Park Terrace Worcester Park Surrey KT4 7JZ**
Telephone:	**01-330 7166**
Summary:	**Excellent file-handling system for raw beginners and programming sophisticates alike**
Price:	**£100 (inc VAT)**

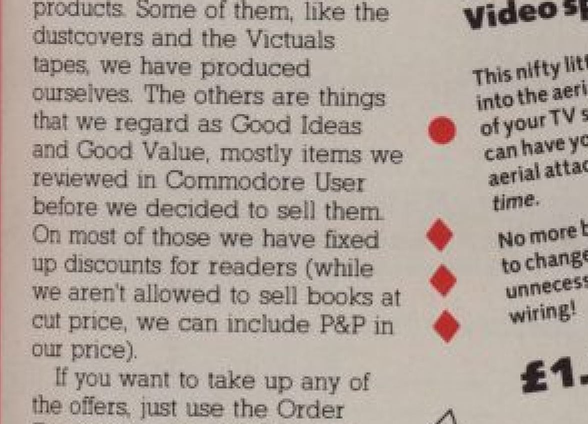
Deals for Readers

Welcome to DEALS FOR READERS, a collection of Special Offers from Commodore User Magazine.

This Catalogue offers you excellent deals on Vic and 64 products. Some of them, like the dustcovers and the Victuals tapes, we have produced ourselves. The others are things that we regard as Good Ideas and Good Value, mostly items we reviewed in Commodore User before we decided to sell them. On most of those we have fixed up discounts for readers (while we aren't allowed to sell books at cut price, we can include P&P in our price).

If you want to take up any of the offers, just use the Order Form on the back page. And take a look through the Catalogue: even if you don't want to buy now, we'd like to know what you might be interested in seeing in future DEALS FOR READERS catalogues – let us know in the space provided on the Order Form.

DESIGN YOUR OWN VIC SCREENS



£4.20

Brilliant idea, though it's simple really: the Cybergram Designs Vic-20 Graphics Aid Pack is a set of overlays and printed sheets on which you can design screen displays. With them you can immediately see the POKE locations you need for display and colour; and you can use successive sheets to set up a specific 'storyboard' from which to organise and visualise the sequences in a graphics program.

Your pack includes planner sheets for the standard 22 x 23 screen and plotter sheets for 1023 x 1023 hi-res graphics using the Super Expander; you also get a set of handy character designer sheets that simplify the construction of your own shapes.

Very neat, very clever – and really useful too. We're glad we can offer the Graphics Aid Pack to you . . . and at a discount on the normal RRP of £4.50.

Video Splitters

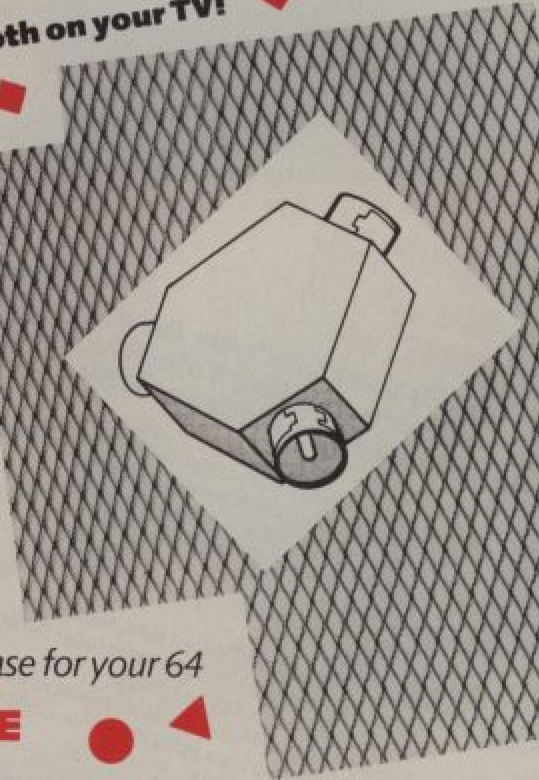
Aerial and computer both on your TV!

Video splitters

This nifty little gadget plugs into the aerial socket at the back of your TV set, and it means you can have your Vic/64 *and* the aerial attached *at the same time*.

No more boring fiddling around to change the plugs, no more unnecessary strain on the wiring!

£1.75

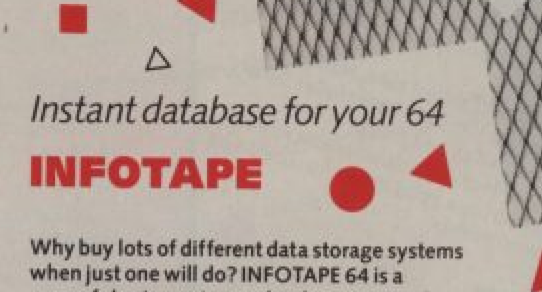


Instant database for your 64

INFOTAPE

Why buy lots of different data storage systems when just one will do? INFOTAPE 64 is a powerful yet easy to use database system for tape users, and stores up to 3,000 data items with you defining the number of fields per record. Totally flexible; and interpretive in nature, with the user having command of what data is stored and how. And file characteristics may be changed after the file has been created. Powerful 19-function calculator is built-in (giving speadsheet capability): batch processor can update or delete all or selected records. A full report generator is included to provide anything from a gummed label for a mail shot to tabular reports . . .

Normal price: £16.95
OUR PRICE: £9.95



Special Offer: *When you upgrade your system to use a disk drive, INFODISK will be able to retrieve your tape records – and your INFOTAPE order from us comes with a £20 off voucher against the disk version!*

A RECOMMENDED ASSEMBLER

for Vic or 64

Tape: £17.95
Disk: £19.95

Our reviewer (June 1983 issue) concluded that Elmhirst's OSIRISAN assembler was "good value at the price." So we signed up to sell it.

Fast, commonsense operation, good features and lots of them, full error reporting . . . what more could you ask of an assembler? Except maybe an editor package.

And – would you believe – it comes with FREDITOR, a general-purpose text editor that can be used for *any* text (as a mini-word processor) and /or to create a source file for the assembler. Features save, move, erase, search, instant replace.



£3.99

FALLING APART?

ORDER FORM ON BACK PAGE

Our Commodore user binder holds 12 issues of the magazine (and Vic Computing fits it too!) Dark blue with the magazine's name in gold: smart, sturdy and sensible – the mags are held in by strong elasticated grips, easier and neater than the kind of binder that has metal rods for the purpose. And compare our price with what other magazines charge you for binders!



VICWEAR

Ah, happy memories . . . our popular collection of good-quality Vic Computing tee-shirts and sweatshirts, all with the characteristic 'Vic Computing' logo.
A choice of four witty slogans or the 'Vic Computing' banner writ large.
Tee-shirts in white, blue or grey: sweatshirts in grey. State colour and size when ordering – we have small, medium, large and extra large. We are running low on stocks, though – check the chart on the Order Form for availability.

Tee-shirts £3.40

Sweatshirts £7.00

TWO

better programs

We've commissioned two special add-ons for the 64 from Whitby Computers, another company whose products we reviewed and liked. Just look what you get:

DAVID'S BASIC
. . . for better programs

Ways with numbers:
AVG averages elements in an array of numbers
SUM sums elements in an array
MIN finds the smallest number in an array
MAX finds the largest

Ways with strings:
PAD$ fills out a string with spaces
BLANK tests a string to see if it's blank or contains only spaces
SEARCH searches array for given string or pattern
SORT sorts arrays
SPC$ gives a string with a specified number of spaces

Coping with keys:
BREAK cancels the RUN/STOP and RESTORE reset
DISABLE kills RUN/STOP
NOKEY kills effect of specified keys

Extra goodies:
CHINKLE rings a bell
ERROR intercepts program errors, lets you branch to an error-handling routine

Cleverer programming:
CIF conditional IF
CEND conditional END
ELIF ELSE IF
ELSE ELSE
POP removes last subroutine from stack – garbage collection, avoids 'out of memory' errors
PUSH puts a subroutine return address on to stack – simulates GOTO
EXEC a bit like PROC or labelled subroutines – executes a previously specified string as a Basic statement
GTO GOTO a line with a REM followed by a label
GSUB ditto for a GOSUB
ROUT as for DEF FN, but allows you to define multiple-line routines
PER performs routines created by ROUT
ON used as ON <key> GOTO or GOSUB – quick and easy form of GET and subsequent tests
SCAN scans string for given character
SWAP loads another program, retaining all variables
SHR$ compresses a number for compact storage
XPD decompresses a number for use
RESTORE as normal, but can also be used to RESTORE to a given line number

Defter displays:
CLOCK continuously displays the time at stated position
COL$ simplifies use of the 15 colours
CURSOR puts the cursor at the specified x/y position
LWIND Load Window – loads a ready-to-go screen display from disk
SWIND Save Window – creates that display
DISP displays centered message

Easier input:
DATE$ turns a numeric date back into a conventional date string format
DATIN foolproof date input routine
GENIN foolproof input routine – checks input against specified pattern of acceptable characters
NUMIN foolproof numerical input

Perfect printing:
PRINT% automatically justifies columns of money figures
PRINT£ adds true printer tabs
SCOPY screen copy
PCTRL Printer Control – sets device number and other characteristics: one command thus lets you handle different printers from a program
QUME$ use a Qume daisywheel printer for plotting

PRICE: **£27.50**

PRICE: £27.50



VIC: ALL YOU NEED TO KNOW

VIC 20 User Guide by John Heilborn and Ran Talbott, published by McGraw-Hill.

There are dozens of books about the Vic. But this one is the best all-rounder we've come across. Not cheap, maybe: but you get a beefy large-format paperback of 387 pages, packed with information and beautifully presented with professional illustrations and clear listings.

Ideal for beginner and expert alike. Hand-holding intro to the Vic; but also includes 'how to use' sections on disk and printer as well. Excellent on graphics and animation, on writing games, on sound (eg a good chunk on combining sound and animation).

£10.95

A GAP ON YOUR WALL?
The Commodore User Poster



£1.75

Remember our February cover, with the enigmatic monk-cum-Renaissance Man looking for the cause of his SYNTAX ERROR?
Well, we produced a poster version of it – and we have a few left over to the first 150 lucky customers. Printed in stunning colour on glossy high-quality paper, A3 size (about 16.5 by 23 ins). Just the thing for your bedroom/clubroom/computer room wall . . .

Sticky keytops? Things falling past the keys into the computer? Don't take the chance. When you're not using your Vic or 64, slip over one of our tailored Commodore User dustcovers – a smart black number featuring the magazine's logo on top. They do keep out dust, but they'll also cope with coffee splashes (anything less than a thunderstorm in fact!), paperclips, cigarette ash, the residue of longhaired cats, and the general detritus of daily life. One size fits all.

MATCHING COVER FOR ANY COMMODORE CASSETTE UNIT

£2.00

Keep your cassette clean too, with a matching black cover – effective, efficient.

Compare our prices. How can we do them so cheaply? And we're not compromising on quality, either: these are some of the best covers we've seen!

WEAR YOUR MAG!

Commodore User tee-shirts and sweatshirts are in good-quality cotton, ideal for late nights in front of the computer or the beach at Torremolinas or the lounge bar at the Pig and Whistle.
Cobalt blue, with the magazine's logo big and bold across the chest. State size when ordering: we have small, medium, large and extra large.



CARTRIDGES FOR THE 64

easier programming!

THE COMMODORE USER TOOLKIT ...for easier programs

What everyone needs:
AUTO automatic line numbering
DELETES deletes specified lines
EDIT deletes forwards — uses RUN/STOP to delete, leaves the cursor where it is
FIND lists all lines containing specified string
HELP lists line where error occurred
LINES instantly calculates the number of lines in your program
MERGE merges program from disk or tape, interleaving lines if necessary
RENU renumber program (including GOTOs, THENs, GOSUBs, etc)
REPLACE finds all occurrences of given string and replaces them with a specified string
TRACE displays last six lines executed in top right corner of screen during execution

Handy for variables:
DUMP lists names and current values of all non-array variables
VAR lists variable names

Sexy sprites:
DESIGN multi-colour sprite editor
SPRITE sets position, colour, mode (expanded, multicolour, transparent) for sprites: turns them on and off
HITBACK detects sprite hitting background
HITSPR detects sprite hitting another sprite
SSPRITE saves sprite data to tape or disk
LSPRITE loads sprite data

Neat extras:
MON Pet-type machine code monitor — commands for display memory and registers, load and save memory blocks, SYS-type execute, return to Basic
USER allows you to add new command words — commands must be previously written in machine code
FUNC defines function keys (the cartridge gives them useful default meanings anyhow, but they can be changed with this)
RESCUE rescues inadvertently NEWed program
SHRINK removes REMs and all unnecessary spaces
CURSOR puts the cursor at the specified x/y position
KILL removes Toolkit commands

PRICE: **£27.50 SPECIAL BARGAIN OFFER:** order the two at the same time and save a fiver — £50 for the pair!

Cut out those SAVE/LOAD errors!

Read/write errors from tape? Mucky keyboard? Grubby screen? Dirt on the tape heads can be infuriating; and who wants a tatty-looking computer?

The Complete Cleaning Kit

Here's the answer — an all-purpose Vic/64 cleaning kit. It contains...

- ★ head cleaner for the cassette deck
- ★ a pack of special lint-free wiping cloths to use with...
- ★ aerosol can of anti-static foam cleanser to lift off grease and dust
- ★ ten anti-static dust-repellent screen wipes
- ★ a package of lint-free cotton bud sticks for those hard-to-get at places (ears?), to use with...
- ★ aerosol can of safe, residue-free cleaning fluid for awkward bits of the tape deck

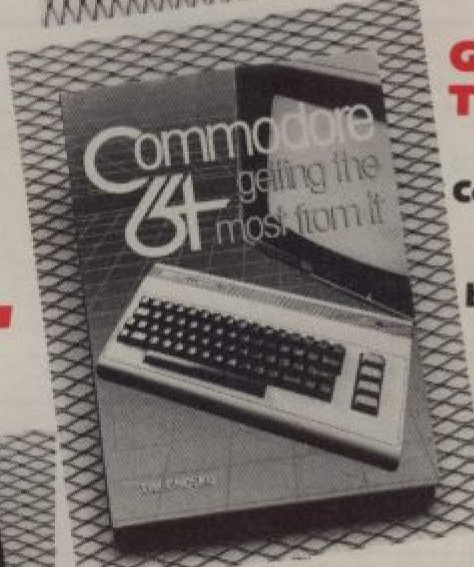
What excuse can you have now?





KEEP IT CLEAN

GET INSIDE THE 64



Commodore 64 — getting the most from it by Tim Onosko, published by Prentice-Hall.

£7.95

Terrific value for the beginner, especially at the price — 303 large-format paperback pages, a 'from the ground up' all-purpose manual/tutorial/reference for the 64. Concise and sensible, clear presentation, well-written. Appendices include substantial contributions from Butterfield on the 64's memory and excellent exposés of sound and graphics.

If you want to have to use only one book to get on top of your 64, buy this one!

Order Form

The prices below include VAT, and postage and packing – but within the UK and Eire only. European and International orders – please add the amounts given opposite to the prices below:
Expect delivery in 28 days. Contact us if you haven't had your order within that time.
All orders subject to availability.

	European	International
Sweatshirts	£1.00	£2.00
Tee-shirts	£1.00	£2.00
All tapes	£ .50	£1.50
Books	£1.50	£3.00
Covers	£ .50	£1.00
Binders	£2.00	£4.00

Write the number you require in the relevant Boxes	T-SHIRTS												SWEAT-SHIRTS			
	White £3.40				Blue £3.40				Grey £3.40				Grey £7.00			
	S	M	L	XL	S	M	L	XL	S	M	L	XL	S	M	L	XL
A. VIC COMPUTING																
B. CAPTAIN KILOBYTE																
C. VICTIM																
D. POKE 36879																
E. UNEXPANDED VIC																
F. COMMODORE USER									£3.75 Blue				£7.75 Blue			

VICWEAR TOTAL SWEATSHIRTS	:	no. ☐ at £7.00 ....
VICWEAR TOTAL TEE-SHIRTS	:	no. ☐ at £3.40 ....
COMMODORE USER TOTAL SWEATSHIRTS	:	no. ☐ at £7.75 ....
COMMODORE USER TOTAL TEE-SHIRTS	:	no. ☐ at £3.75 ....
VICTAPE ONE	:	no. ☐ at £5.00 ....
VICTAPE TWO	:	no. ☐ at £5.00 ....
VIC USER GUIDE	:	no. ☐ at £10.95 ....
64: GETTING THE MOST FROM IT	:	no. ☐ at £7.95 ....
COMPUTER DUSTCOVERS	:	no. ☐ at £2.50 ....
CASSETTE DUSTCOVERS	:	no. ☐ at £2.00 ....
COMMODORE USER POSTER	:	no. ☐ at £1.75 ....
VIDEO SPLITTER	:	no. ☐ at £1.75 ....

CLEANING KIT		:	no. ☐ at £16.95 ....
OSIRISAN ASSEMBLER	VIC TAPE	:	no. ☐ at £17.95 ....
	VIC DISK	:	no. ☐ at £19.95 ....
	64 TAPE	:	no. ☐ at £17.95 ....
	64 DISK	:	no. ☐ at £19.95 ....
THE COMMODORE USER TOOLKIT CARTRIDGE		:	no. ☐ at £27.50
DAVID'S BASIC CARTRIDGE		:	no. ☐ at £27.50 ....
TOOLKIT AND DAVID'S BASIC		:	no. ☐ at £50.00 ....
GRAPHICS AID PACK		:	no. ☐ at £4.20 ....
BINDERS		:	no. ☐ at £3.99 ....
INFOTAPE CASSETTE		:	no. ☐ at £9.95 ....

GRAND TOTAL £.....

NAME	♦ THIS IS YOUR DELIVERY LABEL – PLEASE PRINT CAREFULLY
ADDRESS	TOTAL ENCLOSED:
	cheques or postal orders should be made payable to COMMODORE USER. Or use Access:
	Access card no:
	Date: Signature:

Deals for Readers, Commodore User, The Metropolitan, Enfield Road, London N1 5AZ. 01-241 2448

"I COULDN'T BELIEVE THE SPEED... YOU'RE THE BEST BY FAR."

(Paul Singleton, Cheshire)

We started SOFTWARE SUPERMARKET two years ago with two simple ideas. One, to play all the programs we could and to sell only the very best in each field. And two, to **send out the programs our customers wanted on the same day we received their order.** For the last 2 years, customers in over 40 countries have written to tell us that they appreciate both the speed and the pre-selection of programs. Now, with the rapidly increasing number of Commodore programs available, we hope that you will want the same service (and the same speed) which we have been offering to Spectrum and BBC owners.

This is our first selection of the best Commodore 64 programs. We have quoted **cassette** LOADING TIMES, and tell you if you need a joystick, and if a disk is available. UK prices include VAT, export prices are the same. (This 15% surcharge helps us get foreign orders to you very fast indeed.) **CALL 01-789 8546, ANYTIME, TO ORDER BY VISA OR ACCESS CARD,** from any country where your own laws allow this.

ALL PROGRAMS FOR COMMODORE 64

BEACH HEAD ***"A MULTI-SCREEN ARCADE GAME THAT IS VERY CLOSE TO BEING PERFECT, graphically it is astonishing... a vast number of features and beautiful detail" (PopCompWkly). "Spectacular sound and graphics bring amazing realism to your 64" (PCGames).*** A whole war in one program. 4 skill levels. DEMO of all 6 actions: surprise the enemy, crossing a mined channel, fighter attack, fleet attack, the tank landing and the Final Fortress. In America, Billboard magazine voted it **"the best"** for the 64. 1 or 2 players. Hall of Fame can be saved. JOYSTICK NEEDED. LOAD: 5min 15secs. (US Gold) **CASSETTE: £9.95 DISK: £12.95**

VALHALLA 64 ***"VALHALLA ON THE COMMODORE IS A BETTER GAME... a unique and important game... what is crucial is the general 'speeding-up' of the action... it looks even more like a cartoon... Commodore 64 owners should beg or borrow the money to get this one." (PopCompWkly). "I recommend Valhalla without reservation" (MicroAdventurer). "GAME OF THE YEAR 1984" (British Micro Computing Awards).*** This is a special version of the great adventure - not just a translation: much better animation and graphics. And you really can just sit back and watch the action in 'the first computer movie' if you don't want to join in the 6 quests! 100 illustrated locations: 36 animated characters: all command words are in the clear 48-page manual. You can even summon the dead! NO JOYSTICK. LOAD: 10.00mins. (Legend) **CASSETTE £14.95 (No disk)**

AZTEC CHALLENGE ***"Full marks all round for a program that points the way for CBM-64 programming." (YrComp). "Five stars.... an excellently challenging game." (CompGames)*** Montezuma's Aztec warriors are the world's finest - but his priests demand human sacrifices. Like you - unless you can win through the 7 amazing screens of the Aztec Challenge. DEMO of all 7 screens shows you how different - and how difficult each one is. The music gets faster and louder as you get better at each task. And after you complete all 7, there are 3 extra levels - the last one at night! Totally addictive. 1 or 2 players. JOYSTICK NEEDED. LOAD: 10.00mins. (Audiogenic) **CASSETTE: £8.95 DISK £12.95**

DENIS ***"A rapid-response, superbly complex game that is great fun to play... an excellent game" (PopCompWkly).*** DENIS THROUGH THE DRINKING GLASS casts you as Maggie's hubby. Can you find a drink in the first 10 moves? Explore up to 95 locations in this text adventure. Meet Ken Livingstone and Tony Benn: watch out at Greenham Common: drop in on the Pope and be nice to the Royals. A lot of fun - and jolly difficult! NO JOYSTICK. LOAD: 13.00mins. (Applications) **CASSETTE: £5.50 DISK: £9.50**

FOOTBALL MANAGER ***"AN EXCELLENT SIMULATION, enjoyable to anyone with the slightest interest in soccer." (PersCompNews). "The truly addictive quality of this game is the remarkable way it mirrors a real football manager's problems." (PopCompWkly).*** 3D animated colour graphics of the matches: 4 divisions: transfer market: team selections: relegation and promotion: even the FA cup. 7 skill levels. NO JOYSTICK. LOAD 3mins (Addictive) **CASSETTE £7.95 (No disk)**

TRASHMAN 64 ***"Brilliantly drawn, planned and executed game... thoroughly enjoyable and addictive." (HomeCompWkly). "An entirely original game with great graphics." (PCGames). "It's the graphics that really make the game" (CompChoice).*** As a dustman, you collect bins, trying to keep off the grass, avoid the dogs, pick up tips from householders and try not to drink too much. It sounds simple, but it's great! 1 or 2 players. JOYSTICK. LOAD: 15mins (New Generation) **CASSETTE £7.95 (No disk)**

HEATHROW ***"Simulates as closely as possible the real-life operation of the Air Traffic Control centre at Heathrow." (EduComp). "The satisfaction you'll get from mastering this game is worth every effort." (PopCompWkly).*** Let the author (a real-life Air Traffic Controller) teach you his job! Try to land ten aircraft in 30 minutes: progressive difficulty through 7 levels - including emergencies. ***A simulation: NOT an arcade game.*** DEMO mode: clear instructions. NO JOYSTICK. LOAD: 4mins (Hewson) **CASSETTE £7.95 (No disk)**

SON OF BLAGGER ***"This has got to be the best platform-type game around for the 64" (PCGames).*** Much, much more challenging than 'Blagger'. The Son is a spy, searching National Security HQ for the golden keys. There are 12 rooms full of ladders, slides, killing bushes, conveyors and dissolving floors. It often looks impossible until you suddenly realise... complete map on inlay card, too. KEYBOARD OR JOYSTICK. LOAD: 2mins. (Alligata) **CASSETTE £7.95 (No disk)**

THE QUILL ***"A massively worthwhile investment... almost ludicrously underpriced for what it does." (Crash). "Extremely valuable utility... the best answer yet to the adventure writer's dream of painless programming. (PersCompNews). "Anyone with the minimum of experience can construct an adventure using this, with imagination the only limit" (PopCompWkly).*** WRITE YOUR OWN MACHINE-CODE TEXT ADVENTURES - without any knowledge of machine-code. Create over 200 locations, connect and describe them as you wish - and sell the result if you like. ('DENIS' was written with 'THE QUILL'). Helpful 52-page manual. NO JOYSTICK. LOAD: 8mins.(Gilsoft) **CASSETTE: £14.95 DISK: £19.95**

FLIGHT PATH 737 ***"THIS MUST BE ONE OF THE BEST FLYING GAMES AROUND FOR THE C64. It's a joy to play... the aircraft actually behaves like a real aircraft should" (Comp&VidGames).*** Learn to fly a high-performance jet airliner - taxi, take-off, climb, cruise, descend, approach and land. 6 skill levels - from FIRST SOLO to TEST PILOT and very clear instructions. The cheapest way to fly! **Written by a flight simulator instructor!** JOYSTICK PLUS KEYBOARD. LOAD: 3mins. (Anirog) **CASSETTE £7.95 (No disk)**

ARABIAN NIGHTS Too new for reviews, but one of our favourite new games. Inspired by Scheherezade's famous stories. DEMO of all 8 screens: Sinbad's boat, the raft journey, the cavern, the flying carpet, the city gate, the Sultan's gardens, the battlements, the escape from Baghdad. Beautiful graphics : it's like 8 arcade games in 1 program. AND IT TALKS TO YOU - without hardware needed! Amazing. JOYSTICK NEEDED. LOAD: 4mins 36secs. (Interceptor) **CASSETTE: £7.00 DISK: £9.00**

To: SOFTWARE SUPERMARKET, 87 Howard's Lane, London SW15 6NU

(If you do not want to cut this magazine, write your order out carefully on plain and paper and quote this number: CU1.)

I have a **COMMODORE 64.** I enclose a cheque/PO made payable to Software Supermarket OR Charge my VISA/ACCESS/EUROCARD/MASTERCARD

No: ________________

Signature ....

Please write clearly. If we can't read it, you won't get it.

Name: ....

Address: ....

.... Postcode ....

Phone, if any, in case of query: ....

PROGRAM NAME	CASSETTE	DISK	PRICE

POSTAGE & PACKING: UK Add 55p per order/**EUROPE** Add 55p per program/**OUTSIDE EUROPE** Add £1 per program airmail, plus £1 to total for registered mail.

TOTAL ____________

SOFTWARE SUPERMARKET

VISA/ACCESS CALL 01-789 8546 (24hrs)

The 64 ought to be an excellent computer for games – and fortunately some suppliers are indeed taking advantage of that. Others aren't. Here's this month's crop of reviews.

How do we assess games? Basically we play them – which may sound obvious, except that all the reviewers have seen so many games that they can apply a bit of comparative experience to the evaluation.

We rate games out of five for each of four criteria. **Presentation** means how well the thing is packaged and how good it looks on the screen: dull graphics and poor sound get marked down here. **Skill level** refers to how much skill (of whatever kind) is required to play the game – so if pure chance is involved, the game gets a low mark. (But don't dismiss it on that: some 'chance' games are great fun.) **Interest** is an answer to how well the game did at maintaining the reviewer's interest in it. And **Value for Money** is obvious enough: it's our overall conclusion about how it compares with other games and whether we'd buy it ourselves.

BANANA DRAMA
Keyboard only
Price £7.95

Ever fancied yourself as budding dictator? Well, this game (I am reluctant to call it a simulation) from Visions will allow you to give vent to your power-lust as president of Ananaba, a banana republic (geddit?).

Each month, you get a report on the state of your coffers – and you have the option of paying the State security Organisation (S.S.O.) $1,000 for a full state-of-the-state report if you can afford their services, and their loyalty to you is sufficiently high! This report gives you power and popularity, and the power and loyalty of the all important sectors (ie SSO, Subversives, USSR, Industrialists, Plantation workers, etc.). Next there may be a news report (like "Totalitaria has invaded"), followed by a request from one of the above groups – such as "The Subversives ask you to sack all military chiefs... " You may pay the SSO to give an analysis of the pros and cons of the decision, before deciding whether or not to grant the request.

Then comes the Menu of 'Presidential Options' – ranging from 'Look after Number 1' to 'Please foreign powers'. All options open up to a sub-menu of six options: the former consisting of such things as investing in a Swiss bank account, the latter in buying American computers or Russian cameras.

The object, of course, is to stay in power as long as you can, before being assasinated or causing a rebellion (now you know why you invested in the Swiss bank account and bought the private submarine!)

In all, a good game which will keep the whole family amused. It gives a score at the end of your term of office, which can serve as a yardstick for competition. *DW*

Visions Software

Presentation:	■■□□□
Skill level:	■■■□□
Interest:	■■■■□
Value for money:	■■■□□

SCREEN SCENE



CAVELON
Joystick only
Price £6.90

Cavelon is a game with an original Camelot theme: enter the castle stronghold to rescue the unfortunate Guinevere, battling with six levels of knights and archers as you make your way to the top of the castle, where the fair damsel is held captive.

Each level is a maze of passages, in which are scattered sections of the door, as well as various pieces of armour. You have to gather all the pieces of door and make your way to the exit to advance to the next level. Bonus points are awarded for gathering armour.

You fire cannon-ball type missiles at similarly armed knights and archers, and you can also use a 'zap' if you find yourself in a tight spot, which will render all enemies helpless for a few seconds. Watch out, though: your supply of zaps is limited, but you are awarded an extra zap if you come across Excalibur on your travels.

After battling through six levels, the 'Black Wizard' (sic) must be defeated before you get to rescue Guinevere. Six levels have so far proved a little too much for me, so I haven't yet met up with the aforementioned...

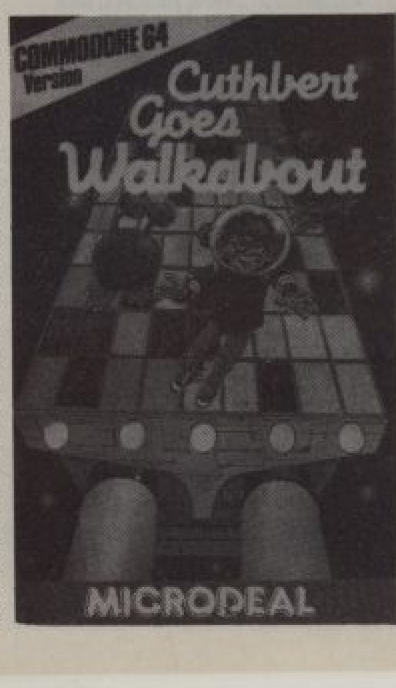
In all, an enjoyable little joust, with graphics and sonics up to par. The game features 'Injection Loading', with Spectrum-style flashing screen during loading (the reason eludes me). *DW*

Ocean

Presentation:	■■■□□
Skill level:	■■■■□
Interest:	■■■□□
Value for money:	■■■■□

CUTHBERT GOES WALKABOUT
Joystick or keyboard
Price £8.00

So that dashing, debonair, swashbuckling charmer Cuthbert is now appearing on the 64. In *C–G–W*, he must run about on a grid of squares, touching each square's corners in order to make it light up, while avoiding the Moronian Invaders, which chase him. In *Q–Bert* fashion, when all the squares have been lit up, the player advances to the next level – but not before Cuthbert does a lap of honour, dancing the Can-can, would you believe?



Controlling ol' Cutie can be quite a demanding task, as Moronians close in from all sides. You can jump over them, but be careful they don't change direction while you are in mid-leap! If you aren't quick enough about completing a sheet, the chief Moronian appears – a deadly foe, who has been known to cheat ... unthinkable.

The cassette-inlay instructions are clear, but state a six-minute loading time. My review copy loaded in a fraction under two minutes. Possibly, Microdeal discovered the joys of Turbo Load too late to change their inlay cards. But rest assured, they have discovered it. *DW*

Microdeal

Presentation:	■■■□□
Skill level:	■■■□□
Interest:	■■□□□
Value for money:	■■■□□

FIRE ANT
Joystick only
Price £7.95

This is a hybrid arcade/adventure game. The joystick directly moves one of the characters; that makes it arcade. The other half of the formula arises from the necessity to collect objects and decipher their possible uses, learning by experience, game by game.

Liberties have been taken with zoological facts: scorpions have adopted social habits and formed a colony. They have seen fit to abduct a queen ant. And as busybody in chief you have undertaken to puzzle your way through eight screens, full of burrows and chambers to effect a rescue. You will draw on skill, intuition and pure guess work as you grab the goodies, evade the patrolling arachnids and evaluate just how to build bridges, bore holes and whatever other imponderables lie in wait in the latter screens. Always, you start at the top of each sector and you eventually make for



the exit at the bottom in order to break through to the next stage.

The fabric of the nests is textured with oodles of colour: no need to make allowances for the scorpions either as they certainly look the part. Competent sound effects with very good 'specials' such as pneumatic drills, frazzling electricity and crunching rockfalls which all add to the superb presentation.

I could have done with more lives: it eventually became frustrating returning to screen one, for once the problems of a particular stage have been solved, a great deal of interest fades leaving you with just a very ordinary game. The fascination lies in the problem solving coupled to the action: the two cannot be divorced. Still, a very impressive game. *LS*

Mogul

Presentation:	■■■■■
Skill level:	■■■■■
Interest:	■■■■□
Value for money:	■■■■■

JAMMIN
Joystick or keyboard
Price £6.90

A completely novel, superbly implemented and highly colourful program revolving around the music business, most strongly featuring full-blown rock 'n' roll and guaranteed to give your SID chip a bashing.

The basic idea is to travel around a conveyor -belt -come -maze-come- Ludo-board in order to retrieve four musical instruments and return them to a central flashing light. You have to match up colours before hopping on or off the track. Bum notes, instrument stealers and (worst of all) dischords all hamper your smooth progress towards the next screen, where the going gets tougher.

Not only is it interactive music all the way (and I don't mean just a soundtrack!) but innovative visual effects are thrown in for good measure. Excellent options boards make for ease of use in a most refreshing game.

It is my solemn duty, however, to advise against the purchase of this tape if it is Ivor Novello only for you. Be really nasty; show it to a friend who decided not to buy a 64!

Taskset *LS*

Presentation:	■■■■■
Skill level:	■■■□□
Interest:	■■■■□
Value for money:	■■■■■

MOON BUGGY
Joystick only
Price £7.95

This is the second version of the genre I have seen to date. In *Troopa Truck* there is a progression of hazards; in this opus they arrive in a random fashion. You are never free from the UFO's aerial bombardment as you guide your buggy over the rugged lunar surface: tanks may trundle towards you at any time loosing off shells as they approach, and mine layers have evidently been active. Boulders need smashing or jumping over, as do the various craters.

It's very much a matter of holding on by the seat of your pants, relying on reflex reactions – no time for cogitation, no room for error. Get your priorities right, co-ordinate evasive leaping with loosing off salvos from the two guns.

The foreground scrolls faster than the background, aiding the impression of moving in a jagged mountainous terrain. Score enough points and the colour scheme changes from two shades of green to yellow and purple. The sound effects are entirely commensurate with the graphical representations, the most frequent noise initially being that of your buggy ditching. Neat and effective visual displays, as you'd expect from Anirog, but the game doesn't pander to your ego; success has to be earned. Bet there are plenty of cover versions to come.

All Anirog 64 games now feature 'Turbo' quick load: can't be bad.

Anirog *LS*

Presentation:	■■■■■
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□

CASH CONTROLLER
COMMODORE 64

HOME BUDGETING & BANKING SYSTEM ON CBM 64 DISK AND CASSETTE

A professional style multi function Cash Controller program. In disk format you can load, and make an entry ... or update your existing records ... in just seconds. This easy to use program can handle up to 400 transactions, giving instant statements of your bank balance.

BANK ACCOUNT

- Statements on demand from any date to date.
- Holds up to 400 transactions.
- Standing order facility.
- All transactions can be automatically coded to allocate up to 16 budget headings.
- Search facility for any single item by description or amount.

HOME BUDGETING

- 16 budget headings, e.g. Gas, Rates, Car, Tax - you can choose the headings.
- Highlights under/over spending.
- Full budget expenditure breakdown.
- Budget "re-think" facility.

LOAN/MORTGAGE CALCULATOR

All you ever wanted to know but didn't like to ask! Calculates:

- **Interest rates**
- **Payback periods**
- **Capital sum**
- **Period of loan**

- **PRINTOUT FACILITY USING STANDARD COMMODORE PRINTERS OR SEIKOSHA GP 100VC.**
- **FULL SECURITY WITH PERSONAL PASSWORD.**
- **SAVE DATA ONTO CASSETTE OR DISK USING 1541 DRIVE.**

DISK £14.95 TAPE £9.95 (inc. P&P)

CREDIT CARD HOTLINE 06286 63531 (24 HOURS)

Please send me:

______	Autocalc 64 DISK	at £19.95
______	Autocalc 64 TAPE	at £14.95
______	Cash Controller 64 DISK	at £14.95
______	Cash Controller 64 TAPE	at £ 9.95

(Overseas orders add £1.50 P&P).

I enclose Cash/Cheque/P.O. payable to Richard Shepherd Software Ltd. OR please debit my ACCESS/VISA card No.

Signature ______ CU 9 84

NAME ______ ADDRESS ______

AUTOCALC 64
COMMODORE 64
THE SPREADSHEET IN A CLASS OF ITS OWN

TAPE £14.95 DISK £19.95

Q: Which spreadsheet is suitable for accountants, engineers, scientists and home users?
A: Autocalc 64 is ideal for any application involving extensive manipulation of data and formulae from financial planning to market research.

Q: Which spreadsheet offers an advanced level of formula handling?
A: Autocalc 64 copes easily with trignometrical functions, parenthesis and boolean logic as well as totalling and averaging.

Q: Which spreadsheet accepts complex conditional statements?
A: Autocalc 64 can handle statements as complex as IF a1<4,000 OR a1>8,000 AND a2 = 500 THEN b1=0.

Q: Which spreadsheet offers a flexible screen format?
A: Autocalc 64 allows you to select (i) column widths from 3 to 30 characters (ii) the number of rows/columns you need (iii) up to 2,000 cells of information (iv) text or numerical entries lined up to the right or the left, or a combination.

Q: Which spreadsheet offers a choice of numerical formats?
A: Autocalc 64 gives you a choice of (i) integers (ii) floating decimal point (iii) currency (iv) any combination of these.

Q: Which spreadsheet offers a full 'replicate' facility?
A: Autocalc 64 has an advanced replication function for transferring text, data, formulae or conditional statements from any cell (or block of cells) to any other(s) without monotonous retyping. A 'go to' facility will take the cursor instantly to any cell of your choice — saving time.

Q: Which spreadsheet is easy to use yet advanced in operation?
A: Autocalc 64 is designed to guide you — helpful error reports diagnose input or formulae errors. A full demonstration program and comprehensive instructions are included.

Q: Which spreadsheet is compatible with standard Commodore printers?
A: Autocalc 64 gives you a printout facility using any of these printers: Commodore 1515, 1525, MPS 801, 1526, MCS 801, DPS 1101, Seikosha GP100VC.

Q: Which spreadsheet is 100% machine code for fast efficient responses, and offers a choice of saving to disk (using 1541 drive) or to tape using a C2N unit?
A: Autocalc 64 — as if you didn't know!

Q: Which spreadsheet sells at a realistic budget price?
A: Autocalc 64 costs just £14.95 on tape, £19.95 on disk inclusive of VAT and P&P.

Q: Where do I get one?
A: Ring us now on 06286 63531 (24 hours) to place your ACCESS or VISA card order, or complete the order form and send it to us today. (Prompt delivery promised). Autocalc 64 is available only direct from Richard Shepherd Software.

CREDIT CARD HOTLINE 06286 63531 (24 HOURS)

RICHARD SHEPHERD SOFTWARE
ELM HOUSE, 23-25 ELMSHOTT LANE, CIPPENHAM, SLOUGH, BERKS. TEL. (06286) 63531



RENAISSANCE
Joystick or keyboard
Price £8.95

This is the ancient(?) game of Othello or Reversi – actually it's a mere century old. Played by humans, winning lines are easily overlooked; so this is one strategy game which gains somewhat from being subjected to the computer's scrutiny.

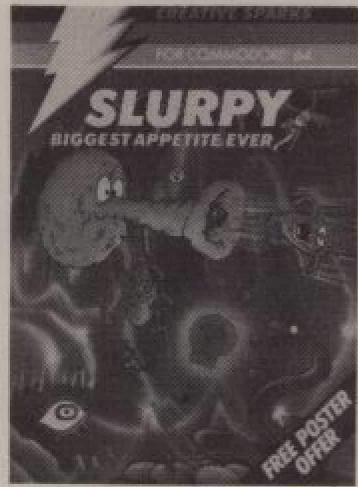
There are eight levels of play (the last being for Smart Alecs only) with ever-deeper analysis by the micro of each move – and ascending difficulty and complexity. All the normal strategy-game functions are provided – things like HELP, TAKE BACK MOVE and SET UP. Full instructions are provided on the insert; and the whole package is markedly superior to 'type-it-yourself' versions.

Nit-picking time: why not allow a choice of counter colours instead of just black and white? But for the acid test ... well, I've bought it myself. LS

Audiogenic

Presentation:	■■■■□
Skill level:	■■■■■
Interest:	■■■■□
Value for money:	■■■■□

SLURPY
Joystick only
Price £7.95



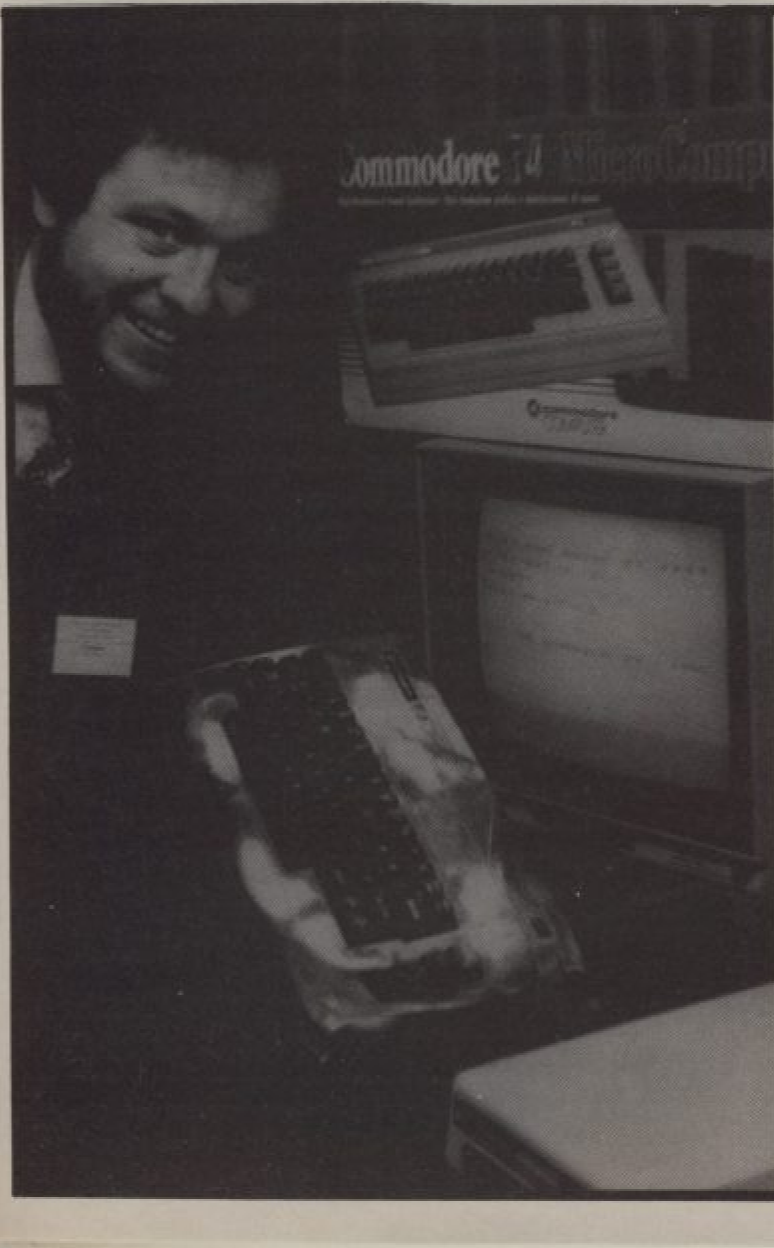
Setting out on a foraging expedition in your local 'pick-your-own-creepy-crawlies' cavern, you discover that it is impossible to move on to the next chamber until all the glow bugs have been supped. You are equipped with an elephant's trunk as a vital part of your anatomy. This acts like a vacuum, sucking up everything within range of it's visible vortex. The blue glow bugs are o.k. but should they turn red they must be spat out immediately, but brown is fine as this gives temporary immunity against attack from the indigenous nasties.

Some of these said creatures, big bugs and birds, hatch from the eggs on the floor, while spiders drop in, creepers perform as their name suggests and the odd snake will slither after you. Unlike your staple diet, these creatures are lethal to the touch and should only be approached behind the cover of your vortex, even then they should be immediately regurgitated if they turn red. There are also some mega-loathesome beings which are totally taboo, along with the sometimes invisible phantom. If you make a meal of slurping your food an earthquake may catch you short, sending down a shower of stalactites.

All the necessary, uncomplicated info is contained in a special instruction screen, which is as it should be in my book. Fanfares. drinking-your-tea-from-the-saucer slurping sounds and whistling winds add to the enjoyment: no jibes at the graphics called for either. Love it. LS

Creative Sparks

Presentation:	■■■■■
Skill level:	■■■■□
Interest:	■■■■■
Value for money:	■■■■■



Caption contest



MAKING FIRE

What's the man with the burnt-out case telling the cameras?

Commodore User CU sweatshirts to the ten best answers received before 1 December.

Name ____________________

Address ____________________

____

____

Sweatshirt size
(ring one) **small medium large extra large**

Name and address of your newsagent ____________________

____

____

____

All about wedges — the program listing

by Chris Preston

Chris Preston's article on Wedges in the ***June*** *issue of* ***Commodore User*** *certainly did generate a lot of interest. Trouble is, we found out the hard way; lots of distraught and irate readers phoned us about the absence of the program listing described in the article.*

With ruddy faces and abject apologies, here (at long last) is the required program. You'll need to refer back to the article itself for the explanation. Oh, and one more thing, the '£' signs in the listing should be typed in as '$' signs.

```
          0000                              ;wedge program
          0000                              ;*************
          0000
          0000
          0000                              ;version 1.0
          0000
          0000
          0000
          0000                              ;date 7 jan 84
          0000
          0000
          4000            *=£4000
4c 6c 40  4000 start      jmp entry
          4003
          4003
          4003
          4003                              ;zero page definition area
          4003                              ;*************************
          4003
          4003 index      =£14              ;string pointer for print
          4003 memtop     =£37              ;top of basic memory
          4003 txtptr     =£7a              ;pointer to basic text
          4003 tmp0       =£a7              ;temporary pointer
          4003
          4003
          4003
          4003                              ;rom subroutine definition area
          4003                              ;******************************
          4003
          4003 chrget     =£73              ;get character from basic text
          4003 chrgot     =£79              ;get last character again
          4003 basrdy     =£c644            ;basic command level
          4003 new        =£c644            ;perform 'new' command
          4003 chrret     =£e390            ;end of original chrget in rom
          4003 wrt        =£ffd2            ;output character to screen
          4003
          4003                              ;address definition area
          4003                              ;***********************
          4003
          4003 stack      =£100             ;start of 6502 stack area
          4003 parse      =£c48c            ;return address from parse routine
          4003 exec       =£c7e6            ;return address from exec routine
          4003 if         =£c942            ;return address from if routine
          4003                              ;message definition area
          4003                              ;***********************
          4003
57 45 44  4003 mess1      .text 'wedge activated.
47 45 20
41 43 54
49 56 41
54 45 44
2e
0d        4013            .byte £d
54 48 45  4014            .text 'the following extra'
20 46 4f
4c 4c 4f
57 49 4e
47 20 45
58 54 52
41
0d        4027            .byte £d
```

```
43 4f 4d 4028          .text 'commands have been'
4d 41 4e
44 53 20
48 41 56
45 20 42
45 45 4e

0d       403a          .byte £d
41 44 44 403b          .text 'added:'
45 44 3a

0d       4041          .byte £d
0d       4042          .byte £d
48 45 4c 4043          .text 'hello'
4c 4f
00       4048          .byte 0
         4049
         4049
0d       4049 mess2    .byte £d
48 45 4c 404a          .text 'hello john! how are you?'
4c 4f 20
4a 4f 48
4e 21 a0
48 4f 57
20 41 52
45 20 59
4f 55 3f

0d       4062          .byte £d
00       4063          .byte 0
         4064
         4064
         4064                                 ;command table
         4064                                 ;*************
         4064
48 45 4c 4064 comtab   .text 'hellO'
4c cf
34 41    4069          .word hello-1
00       406b          .byte 0
         406c
         406c
         406c
         406c                                 ;main program area
         406c                                 ;*****************
         406c
         406c
a9 40    406c entry    lda #>start            ;set top of memory to protect prog
                                              ;am
85 38    406e          sta memtop+1
a9 00    4070          lda #<start
85 37    4072          sta memtop
20 44 c6 4074          jsr new
a9 4c    4077          lda #£4c               ;modify chrget
85 7c    4079          sta chrget+9
a9 8d    407b          lda #<decode
85 7d    407d          sta chrget+10
a9 40    407f          lda #>decode
85 7e    4081          sta chrget+11
a9 03    4083          lda #<mess1            ;display opening banner
a0 40    4085          ldy #>mess1
20 24 41 4087          jsr print
4c 44 c6 408a          jmp basrdy
         408d
         408d
         408d
         408d                                 ;this is the command decode sectio
                                              ; of the program
         408d
         408d
48       408d decode   pha                    ;save 6502 registers on stack
8a       408e          txa
48       408f          pha
98       4090          tya
48       4091          pha
ba       4092          tsx                    ;make sure we are in program mode
bd 04 01 4093          lda stack+4,x
a8       4096          tay
bd 05 01 4097          lda stack+5,x
c0 42    409a          cpy #<if               ;is the interpreter executing an if
                                              ; statement ?
d0 04    409c          bne decd11
c9 c9    409e          cmp #>if
f0 10    40a0          beq decd6
c0 e6    40a2 decd11   cpy #<exec             ;executing a statement ?
d0 04    40a4          bne decd4
c9 c7    40a6          cmp #>exec
```

```
f0 08     40a8          beq decd6
c0 8c     40aa decd4    cpy #<parse       ;executing a direct statement?
d0 2c     40ac          bne return
c9 c4     40ae          cmp #>parse
d0 28     40b0          bne return
a9 64     40b2 decd6    lda #<comtab      ;set tmp0 to point to command table
                                          ;
85 a7     40b4          sta tmp0
a9 40     40b6          lda #>comtab
85 a8     40b8          sta tmp0+1
a2 00     40ba          ldx #0
a0 00     40bc decod7   ldy #0
a1 a7     40be decd12   lda (tmp0,x)      ;get character from command table
51 7a     40c0          eor (txtptr),y    ;compare with character in basic te
                                          ;xt
f0 3f     40c2          beq decod1
c9 80     40c4          cmp #£80          ;test for abbreviated command
f0 21     40c6          beq decod2
20 1a 41  40c8 decod3   jsr fendcm
18        40cb          clc               ;increment tmp0 to skip over routir
                                          ;e address
a5 a7     40cc          lda tmp0
69 03     40ce          adc #3
85 a7     40d0          sta tmp0
90 02     40d2          bcc decod5
e6 a8     40d4          inc tmp0+1
a1 a7     40d6 decod5   lda (tmp0,x)      ;test for the end of the command ta
                                          ;ble
d0 e2     40d8          bne decod7
68        40da return   pla               ;restore registers
a8        40db          tay               ;note that all the command routines
                                          ; must
68        40dc          pla               ;jump here at the end
aa        40dd          tax
68        40de          pla
c9 20     40df          cmp #£20          ;was the character a space?
d0 03     40e1          bne decod8
4c 73 00  40e3          jmp chrget        ;get next character
4c 90 e3  40e6 decod8   jmp chrret        ;jump to end of chrget in rom
a1 a7     40e9 decod2   lda (tmp0,x)      ;reached the end of the command ?
10 1d     40eb          bpl decod9
38        40ed decd13   sec               ;update txtptr to point to end of c
                                          ;ommand
98        40ee          tya
65 7a     40ef          adc txtptr
85 7a     40f1          sta txtptr
90 02     40f3          bcc decd10
e6 7b     40f5          inc txtptr+1
a0 01     40f7 decd10   ldy #1            ;jump to routine to handle command
b1 a7     40f9          lda (tmp0),y
aa        40fb          tax
          40fc
c8        40fc          iny
b1 a7     40fd          lda (tmp0),y
48        40ff          pha
8a        4100          txa
48        4101          pha
60        4102          rts
          4103
c8        4103 decod1   iny
20 13 41  4104          jsr incptr
4c be 40  4107          jmp decd12
          410a
c0 01     410a decod9   cpy #1            ;don't allow abbreviated commands o
90 cc     410c          bcc return
20 1a 41  410e          jsr fendcm
30 da     4111          bmi decd13
          4113
          4113
          4113
          4113
          4113                            ;common subroutine area
          4113                            ;**********************
          4113
          4113
          4113                            ;incptr - increments tmp0 by one
          4113                            ;         inputs : tmp0
          4113                            ;         outputs : tmp00
          4113
          4113                            ;         registers used : none
          4113                            ;         flags affected : z = 0
          4113                            ;         subroutines called : none
                                          ;
          4113
e6 a7     4113 incptr   inc tmp0
```

```
0194 d0 02     4115          bne incpt1
0195 e6 a8     4117          inc tmp0+1
0196 60        4119 incpt1   rts
               411a
               411a
               411a
               411a
               411a                         ;fendcm - searches for the end of a
                                            ; command
               411a                         ;        in comtab
               411a                         ;        inputs : tmp0
               411a                         ;        outputs : tmp0
               411a                         ;        registers used : none
               411a                         ;        flags affected : z; n=1
               411a                         ;        subroutines called : incp
                                            ;tr
               411a
a1 a7          411a fendcm   lda (tmp0,x)   ;end of command ?
30 05          411c          bmi fendc1
20 13 41       411e          jsr incptr
d0 f7          4121          bne fendcm
60             4123 fendc1   rts
               4124
               4124
               4124
               4124
               4124                         ;print - prints a string on the scr
                                            ;en
               4124
               4124                         ;       the string ends with a zer
                                            ;o byte
               4124                         ;       inputs : string address ir
                                            ; ac (lsb) and yr (msb)
               4124                         ;       outputs : none
               4124                         ;       registers used : all
               4124                         ;       flags used : all
               4124                         ;       subroutines called : wrt
               4124
85 14          4124 print    sta index
84 15          4126          sty index+1
a0 00          4128          ldy #0
b1 14          412a print2   lda (index),y
f0 06          412c          beq print1
20 d2 ff       412e          jsr wrt
c8             4131          iny
d0 f6          4132          bne print2
60             4134 print1   rts
               4135
               4135
               4135
               4135                         ;command routine area
               4135                         ;********************
               4135
               4135                         ;hello - prints greeting message on
                                            ; the screen
               4135
a9 49          4135 hello    lda #<mess2
a0 40          4137          ldy #>mess2
20 24 41       4139          jsr print
68             413c endcom   pla            ;all commands must come here at the
                                            ; end
a8             413d          tay
68             413e          pla
aa             413f          tax
68             4140          pla
a5 7b          4141          lda txtptr+1   ;direct mode ?
c9 02          4143          cmp #2
d0 03          4145          bne endcm1
4c 44 c6       4147          jmp basrdy     ;return to command level
4c 79 00       414a endcm1   jmp chrgot     ;start execution of next statement
               414d          .end
```

```
basrdy  c644   chrget  0073   chrgot  0079   chrret  e390   comtab  4064
decd10  40f7   decd11  40a2   decd12  40be   decd13  40ed   decd4   40aa
decd6   40b2   decod1  4103   decod2  40e9   decod3  40c8   decod5  40d6
decod7  40bc   decod8  40e6   decod9  410a   decode  408d   endcm1  414a
endcom  413c   entry   406c   exec    c7e6   fendc1  4123   fendcm  411a
hello   4135   if      c942   incpt1  4119   incptr  4113   index   0014
memtop  0037   mess1   4003   mess2   4049   new     c644   parse   c48c
print   4124   print1  4134   print2  412a   return  40da   stack   0100
start   4000   tmp0    00a7   txtptr  007a   wrt     ffd2
```

Using the 64's Function Keys – the program listing

by John Rampling

The blunders continue: last month, we didn't manage to publish the Basic program that accompanies John Rampling's article on defining your own Function keys for the 64. The culprits are now standing in a corner. Here is the omitted program, complete with yet another truckload of apologies to distraught readers.

But you'll need to refer back to the **August** *edition of* **Commodore User** *for a complete explanation of what's going on. It's a good idea to type the program in using lower-case mode.*

```
10 REM   *** KEY DEFINITON PROGRAM ***
20 REM   *** JOHN RAMPLING  1984   ***
25 :
30 REM   *** THE IMPORTANT LINES   ***
31 REM   *** OF THIS PROGRAM ARE   ***
32 REM   *** LINES 80 TO 450; YOU  ***
33 REM   *** CAN LEAVE OUT THE     ***
34 REM   *** REST TO KEEP IT SHORT ***
36 :
37 POKE53281,7:POKE53280,8:GOSUB500
40 PRINT"██  IO DEFINE ONE OF THE UNSHIFTED KEYS"
41 PRINT"  (I.E. KEYS F1, F3, F5 & F7), PRESS "
42 PRINT"  THE ┤Γ/I ┘┌L KEY TOGETHER WITH THE"
43 PRINT"  FUNCTION KEY CHOSEN: THEN PRESS THE"
44 PRINT"  ─┐ ╱─╱ KEY."
45 PRINT"█  IO DEFINE A SHIFTED KEY (F2, F4, F6"
46 PRINT"  OR F8), USE THE ┤OMMODORE LOGO KEY."
47 PRINT"█  IHE PROGRAM WILL ACCEPT DEFINITIONS"
48 PRINT"  OF UP TO 64 CHARACTERS IN LENGTH:"
49 PRINT"  USE THE [←] SYMBOL TO DENOTE ─┐ ╱─╱."
50 PRINT"█  ┤HOOSE THE MEMORY LOCATION IN WHICH"
51 PRINT"  THE MAIN MACHINE CODE PROGRAM IS TO"
52 PRINT"  BE STORED: PRESS THE SPACE BAR"
53 PRINT"  TO VIEW THE OPTIONS..."
55 :
60 GET A$:IFA$<>" "THEN60
65 :
70 GOSUB500
80 PRINT"█  ●ELECT FROM THE FOLLOWING:-"
81 PRINT"█  1) IOP OF 4╯ ─♠╲ BUFFER COMMENCING"
82 PRINT"     AT MEMORY LOCATION $─‾00"
83 PRINT"█  2) ●TART OF 4╯ ─♠╲ BUFFER COMMENCING"
84 PRINT"     AT MEMORY LOCATION $─000"
85 PRINT"█  3) IOP OF I♠●╲─ ─♠╲ COMMENCING"
86 PRINT"     AT MEMORY LOCATION $9‾00"
87 PRINT"█  4) ╲IDDLE OF I♠●╲─ ─♠╲ COMMENCING"
88 PRINT"     AT MEMORY LOCATION $4000 █"
90 INPUT"  ●ELECT 1 TO 4";IN
100 GOSUB 500
150 ON IN GOTO211,212,213,214
200 :
210 GOTO90
211 BY=38909:A=205:GOTO230
212 BY=38909:A=192:GOTO230
213 BY=38143:A=157:GOTO220
214 BY=14333:A=64
220 POKE52,A:POKE56,A
230 PRINT"█     IASIC PROGRAM SPACE CLEAR;"
240 PRINT"█   "BY" BYTES."
250 FORW=679TO753:READD:POKEW,D:NEXT
260 X=A*256:FOR W=X TO X+511:POKEW,0:NEXT
270 FOR W=X+512 TO X+715:READ D:POKEW,D:NEXT
275 :
280 POKE686,A+2:POKEX+519,A+2:POKEX+660,A+2:POKEX+663,A+2
285 SYS679
290 PRINT"███     ‾RESS ─╱╱ ●I┌┐ ╱ ─‾●IΓ─‾ KEYS"
291 PRINT"     BEFORE USING CASSETTE PLAYER."
292 PRINT"█     ‾NTER ● I● 679 TO RE-ENABLE THE"
293 PRINT"     FUNCTION KEY ROUTINE."
294 :
295 NEW
296 :
300 DATA 120,169,0,141,20,3,169,207
301 DATA 141,21,3,88,96,13,83,89
302 DATA 83,55,49,56,13,145,68,69
303 DATA 70,73,78,69,32,75,69,89
304 DATA 32,70,0,58,32,32,0
305 DATA 162,0,189,188
306 DATA 2,32,210,255,232,224,16,208
307 DATA 245,162,0,32,207,255,201,13
308 DATA 208,2,169,0,157,0,205,240
309 DATA 5,232,224,64,144,237,96,0
400 DATA 174,205,2,240,3,76,154,207
401 DATA 165,197,201,64,208,3,76,49
402 DATA 234,201,4,208,6,162,0,160
403 DATA 49,208,28,201,5,208,6,162
404 DATA 64,160,51,208,18,201,6,208
405 DATA 6,162,128,160,53,208,8,201
406 DATA 3,208,219,162,192,160,55,173
407 DATA 141,2,208,8,173,21,3,56
408 DATA 233,2,208,78,201,1,208,8
409 DATA 173,21,3,56,233,1,208,66
410 DATA 201,4,208,8,173,21,3,56
411 DATA 233,2,208,15,201,2,240,4
412 DATA 201,5,208,170,173,21,3,56
413 DATA 233,1,200,142,231,2,141,232
414 DATA 2,140,201,2
416 DATA 162,0,160,0,189,180,2,157
417 DATA 119,2,232,224,8,208,245,134
418 DATA 198,162,255,160,255,136,208,253
419 DATA 202,208,248,76,49,234,142,161
420 DATA 207,141,162,207,162,0,164,198
421 DATA 208,241,160,0,189,0,192,240
422 DATA 24,201,95,208,2,169,13,153
423 DATA 119,2,232,200,224,64,240,9
424 DATA 192,10,208,232,142,205,2,16
425 DATA 5,162,0,142,205,2,132,198
426 DATA 224,0,208,199,240,137
450 DATA 0,0,0
460 :
500 PRINT"██  ┌──────────────────────────────────┐"CHR$(14)
501 PRINT"  I█ ─╱╱─I╲Γ╱ ╱‾I ‾‾─╲╱╲I╲Γ╱ ┐┘┌I─♠╲ I"
502 PRINT"  └──────────────────────────────────█":RETURN

READY.
```

Take 5 for the 64



Commodore 64 Machine Code Master

David Lawrence, who wrote The Working 64, gets a credit, as co-author of Commodore 64 Machine Code Master. The purpose of this book is not to teach machine code as such, but to let the reader study machine code in a practical manner.

Like The Working 64, it's split into a large number of small modules; that makes entering the programs much easier. The section on creating new commands is well detailed – I only wish this book had been around two years ago when I was learning the hard way!

Few books are perfect, but about the only criticism I could find with this was the slightly awkward assembler syntax for indexed instructions. Instead of taking the instruction LDA $FFFF,X which is what the disassembler gives, the slightly different LDA $FFFF.X must be used. This is because reading the program from tape or disk would give an error if a comma was in the middle of the line.

If you have learnt or are learning machine code and want to become proficient, this book is a very good way to do so. And Sunshine is now selling the tools from this book on a cassette at £14.95 to save you the effort of typing the programs in (though I feel you would probably learn more if you entered them). Conclusion? One of my favourites.

The Book:	Commodore 64 Machine Code Master
The Authors:	David Lawrence and Mark England
The Publisher:	Sunshine Books
The Price:	£6.95
The Reviewer:	David Bolton
The Conclusion:	Excellent

Commodore 64 Exposed

Commodore 64 Exposed might sound like something from the tabloid press, but really it's a 64 equivalent of *Vic Revealed* (and an alternative to the forthcoming follow-up *64 Revealed* from Nick Hampshire). This book is aimed at the programmer who wishes to progress beyond simple programs, or perhaps for the experienced programmer from another machine who wishes to become quickly acquainted with the 64.

So this one and *Using the 64* are very alike in subject matter; but they differ greatly in presentation.

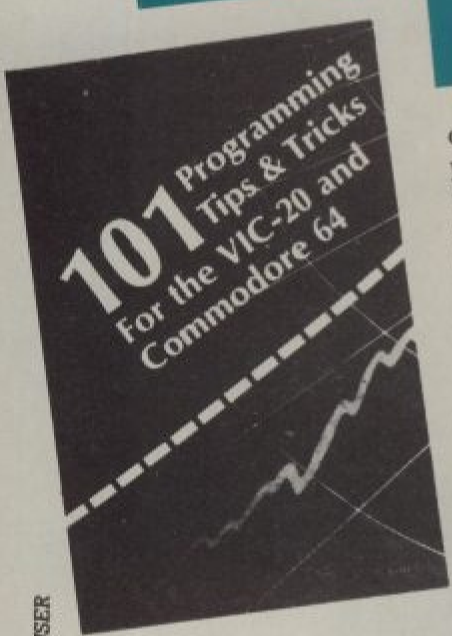
Bruce Bayley moves along at a fast pace, covering binary and hexadecimal by the end of Chapter One and including machine code routines by Chapter Three. Sound is covered in Chapter Four and again machine-code is used to show special effects.

Machine code is not introduced as a separate topic until Chapter Six – when the going gets a little heavy. Thankfully, there are always many examples (which usually include a Basic loader and assembly source code); I particularly liked the program which displayed 16 sprites at once on the screen.

The last Chapter looks at peripherals like paddles, joysticks, disks and printers; and the whole thing is rounded off with some useful technical appendices.

Taken by itself this is a very good aid for anyone who would find the *Programmer's Reference Guide* a little daunting and needs a little assistance. The use of machine code to show off the 64's capabilities is particularly noteworthy.

The Book:	Commodore 64 Exposed
The Author:	Bruce Bayley
The Publisher:	Melbourne House
Price:	£6.95
The Reviewer:	David Bolton
The Conclusion:	Good alternative to the *Programmer's Reference Guide.*



101 Programming Tricks For Your Vic and 64

In brief, I was very disappointed with this book. From the cover I thought it would have been full of dodges and programming goodies which would make life easy or show off nice features of the machines: instead it consists of 101 short programs in Basic each demonstrating a simple task like calculating averages, rolling dice or currency conversion.

The level of programming is very simple; arrays, for instance, are never featured, and hardly any attempt is made to show off special features of the computer like user-defined characters. But what really annoyed me was the number of programs which had POKEs to the sound generators ... but which were for the Vic. There were 16 of them, and no mention was made of the fact that they'd run only on the Vic. Any 64 owner would get very frustrated at these not working, and there is a chance that the 64 would crash in some cases.

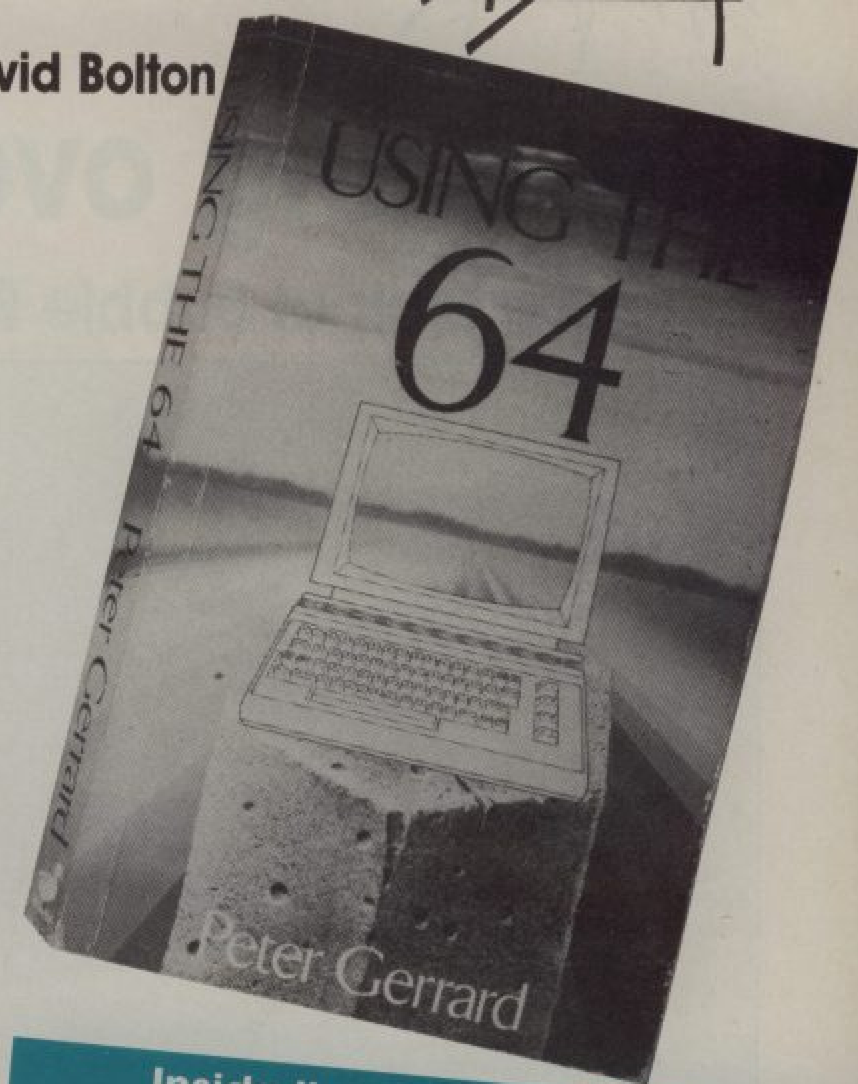
If you've just acquired a Vic and are learning Basic this book might be of some benefit: I could not honestly recommend it to any 64 owners.

The Book:	101 Programming Tricks For Your Vic and 64
The Author:	Howard Adler
The Publisher:	n/a
Price:	n/a
The Reviewer:	David Bolton
The Conclusion:	Disappointing – ok maybe for Vic owners



64 books reviewed

by David Bolton



Using the 64

Using the 64 was written by Pete Gerrard, former editor of a rival magazine (but I'll not hold that against him). And it is a very readable book, which starts off for complete beginners and finishes at quite an advanced level. He writes in a friendly manner, though this style means he sometimes glosses over topics with a touch less detail than is really required.

A very good feature of the book is the use of substitute codes in all of the Basic programs: [REV OFF] is much easier to pick up than the usual reverse bar. I only wish all magazines and books would standardise on substitute codes.

This is a book which moves into machine code at an early level (Chapter three), and includes a listing of EXTRAMON in one of the appendices so that the diligent reader can try out all of the examples. There are many people I know who have mastered Basic to a competent level and would like to learn machine code. *Using the 64* is a good book for that, but I would like to see some of the sections expanded upon with more explanations. It's not cheap and it's not the only book covering this area; but if you like a great deal of useful information in a large volume then save up and buy it. There is a lot that I have not seen printed anywhere else, for instance timings of Basic statements and a full list of Basic and Kernal ROM addresses (three pages).

I would have no hesitation in claiming that this is one of the better 64 books around ... were it not for the silly mistakes which pop up now and then. Too much haste in bringing out this book has led to too many mistakes slipping past the proof reader.

Most of the mistakes are a bit silly, like a utility program which lets you examine the status of both the IEEE and the disk processor in a 1541 disk unit – Commodore would be very interested to know this as they only build one processor into 1541s! I trust that the second edition will have all the mistakes corrected. Nevertheless, all in all it's a very good book.

The Book:	Using the 64
The Author:	Pete Gerrard
The Publisher:	Duckworths
The Price:	£9.95
The Reviewer:	David Bolton
The Conclusion:	Good but marred by small mistakes

Inside the Commodore 64

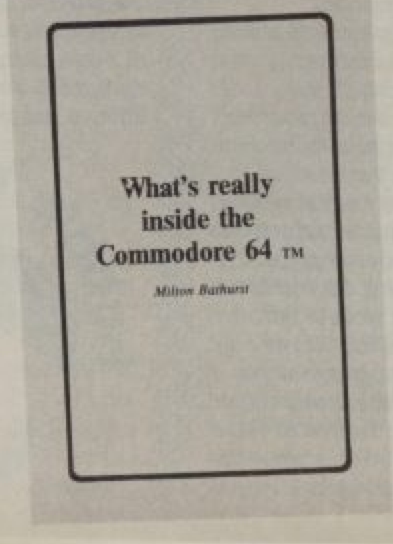
Inside the Commodore 64 is for the machine-code addict, as it consists of a complete disassembly of the 64's Basic and Kernal ROMs.

If you've completed Machine Code Master and want to understand more how the 64 functions, this book is probably the best way. Although Using the 64 has a list of ROM entry points, Inside the 64 is much better documented (almost each line): and it is complete within itself, too.

The disassembly is in two parts – the Basic and the Kernal. Each is fully cross-referenced, so that all references say to location $7A can be identified. All subroutines, branches and jumps are also cross-referenced: tracing program flow is that much easier like this, and it lets you find out where subroutines are called from – no mean task in 16K of machine code.

Incidentally, through reading this book I think I've actually found a bug in Commodore's programming. The OPEN and CLOSE file statements call the same subroutine to evaluate parameters; so OPEN 1,3,8, "FRED" and CLOSE 1,3,8, "FRED" will both work. But CLOSE 1,2,3,4 gives an error and CLOSE 1,2,3 only closes channel 1, not 1, 2 and 3.

My complaints about this book are that it is badly bound and very expensive (it's a US import, available in the UK at just under £13) – my own copy has been extensively thumbed and several pages are now loose. Nevertheless, if you are into serious 64 machine code programming, it is a must!



The Book:	Inside the Commodore 64
The Author:	Milton Bathhurst
The Publisher:	Sunshine Books
Price:	£12.95
The Reviewer:	David Bolton
The Conclusion:	A must for serious machine-code programmers

Bubbling over with software

Taking a look at Bubble Bus

by Bohdan Buciak



Bubble Bus has always tried to be different from the mainstream of games software houses. Instead of projecting an image of mystery and fantasy – the standard fare of most games producers – it's managing to succeed by emphasising an element of childish fun. In fact, you won't find any mouldy outer-space zapping games in the whole range it's produced so far. So what kind of people are Bubble Bus and are they as effervescent as their name suggests? Bohdan Buciak popped down to Kent to see them.

Games software houses turn up in the unlikliest places, and Bubble Bus is no exception. It's rather proud of living in a barn – albeit a lovingly restored and converted one – in the sleepy Kentish town of Tonbridge. From there it has managed to produce a range of software which amounts to four Vic utility programs, conversions of them plus six games for the 64.

That's not a particularly large range considering that the company's been involved in the industry almost from the beginning. Most other software houses produce new games almost as quickly as they spend their profits – with the result that only a few become classics and the rest are, at best, mediocre.

"We've always gone for quality and not quantity", asserts Mark Meakings, one of Bubble Bus's two directors. "We realise that everything we do must enhance the company's reputation." And the conspicuous absence of a Space Invaders clone? "It's a conscious attempt to be different. We appreciate that space games sell; the problem is that not enough people put sufficient thought into originality and being different."

That sounds like a sensible and professional approach, qualities Meakings has probably acquired from a business background before entering the games market. He set up Computer Room about five years ago as a business computer dealership: that company, which still exists, eventually spawned Bubble Bus. Business and marketing skills may be prerequisite for running a company: quite a few games producers sadly lack either.

Computer Room sold mainly Commodore business systems and Apple computers. But Meakings soon realised that this wasn't going to make him the sort of money he was expecting. "At that time, a lot of people were getting on the bandwagon and a great deal of price-cutting was going on. So I decided to get involved in software instead."

Two-man band

That's where Sandy Marchant came in, now Bubble Bus's second director, with the unlikely distinction of having been a programmer and analyst with the Ministry of Defence.

He didn't join Computer Room to produce games; that took considerably more time to hatch. The Meakings and Marchant plan was to produce business software, so Sandy sat down and wrote a production control system plus a package for newsagents. Both still appear in Commodore's Approved Product Catalogue for the Pet.

Then the games market really opened up with the introduction of the Vic. Consequently, the Meakings Marchant duo couldn't help noticing that people were producing and selling lots of games and driving bigger cars. Still, Mark Meakings was haunted by a desire not to flow with the current; he decided to approach the market by a side-door.

"We thought we could do something different for the Vic by writing utilities." Actually, those utilities are still available and continue to sell steadily. There's a basic word processor, a poster and label printer and a unique program called *Advertiser*, which turns your screen into a moving message display. (All have now been converted for the 64 too.)

Sales of utilities didn't produce the bags of money Meakings had envisaged, let alone the volumes of notes being gathered in by dedicated software houses. "The utilities did moderately well but

we weren't bowled over by their success. We were selling a few; the games people were selling in thousands. So we decided we had to get into games."

Just to add to the urgency of doing that, the 64 appeared on the scene. With its new potential, Meakings just couldn't resist the challenge. "We've traditionally been associated with Commodore and we had a lot of potentially useful contacts with Commodore dealers. In any case, we didn't have time to check out other machines: and it seemed obvious that the 64 would supercede the Vic."

Along with the company's new direction came a new name – "we needed it for the sake of credibility". What Meakings is saying is that selling both expensive technical software and games under the same name is a particularly uncomfortable mix: one invariably undermines the other.

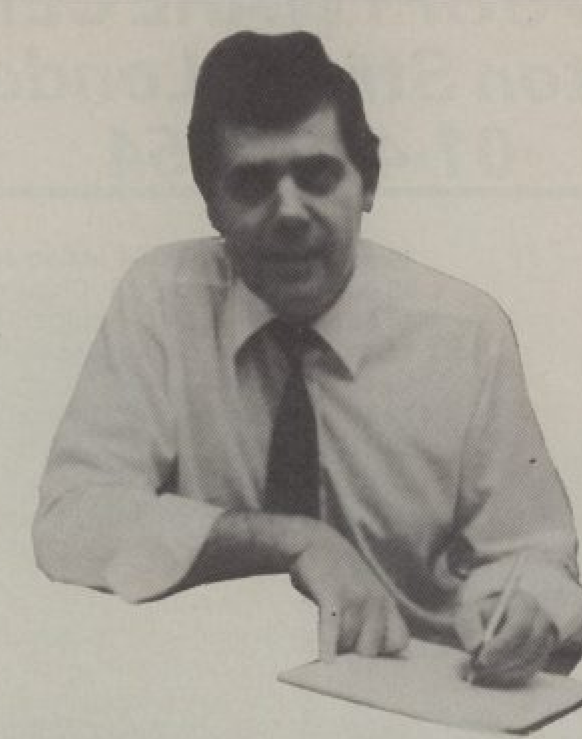
So everyone sat down and put their brains together to think up an appropriate name. After three hours, somebody had come up with 'Bubble Software' – and then one brilliant individual metioned 'bus'. "There was no logical reason for the choice", recalls Meakings, "except that it allowed us to be different from everybody else." That desire to be unique, no doubt. The logo design seems to have appeared in an equally casual manner. "We used someone from a graphics studio round the corner. He designed the logo in his bathtub on a Sunday morning."

Strange days

With the new image and new direction came a new programmer, Nick Strange, who had already worked with Sandy Marchant at the MoD. He got the job of writing the first game and a fairly strict brief of what that game should be. "We wanted to get off to a good start", recalls Meakings. "It had to be a game that wouldn't date quickly and would have a long shelf-life – probably something sporty."

So Strange sat down for four months and wrote *Hustler*, a good simulation of pool. That has now become Bubble Bus's top title, selling about 30,000 copies to date; quite an achievement for Strange, since he'd never written a game before.

With that success under his belt he applied himself to a more difficult project, though still with the idea of simulating an already well-known and popular games.



He spent innumerable hours on the table-football game the company had installed in the loft ... and eventually came up with *Kick Off*, an on-screen version of it.

Since then, two new programmers have arrived. The first was Terry Owen, a Falklands veteran who's responsible for the newish *Flying Feathers*. The game involves a gamekeeper shooting eagles to stop them stealing fish, a scenario that has incurred the wrath of the Royal Society for Protection of Birds who've requested that it be withdrawn from the market. Meakings won't do that: "The idea is fantasy, a bit of fun. No malice was intended towards animals". Just as well there's no Flak from the Aetherius Society for the protection of alien spaceships...

Like Bubble Bus's other programmers, Terry Owen had no previous experience of writing games; he'd merely dabbled with a Spectrum. But that didn't seem to bother Meakings. "We were looking for someone with promise who we could train ourselves because we've already got very experienced software people." Makes a change from the kind of software houses who won't let you through the door unless you've already written the substantial portion of a block-buster.

But Meakings is quick to dispel the impression that he *isn't* amenable to wild-eyed programmers who hot-foot it to his door – and many other doors, no doubt – for an opportunity to display their wares.

The 16-year-old Richard Clarke is a prime example: "he walked in off the street with a game he'd written at home on the Vic. It was technically very good, but it was yet another version of *Pacman*. So we bought him a complete 64 system and gave him a project to do in his spare time."

Meakings emphasises 'spare time', because Richard was still at school then. That project turned out to be *Bumping Buggies*, the second of Bubble Bus's new games. Richard has just finished his O-Levels and is all set for a fruitful career with Bubble Bus. Where would games houses be without their whizz-kid teenagers?

Ahoy matey

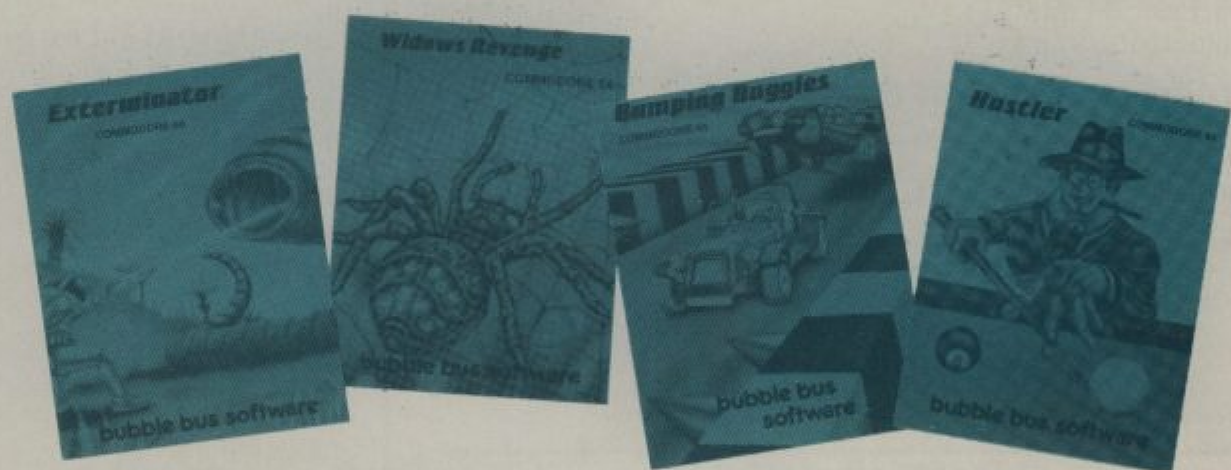
Two of the games in the Bubble Bus range were not written in-house. Both *Exterminator* and *Widow's Revenge* are licensed from an American software house. And Meakings got hold of them through a dubious and tortuous route – "We got them from a guy who's notorious in the industry as a pirate and a crook. We knew the games had been pirated so we found out which software house had written them and came to an arrangement."

That brings us to the sensitive subject of piracy. Meakings recalls an occasion when *Kick Off* was suspiciously high in one of the numerous software charts at a time when Bubble Bus was selling hardly any copies.

Still, he is loathe to hurl accusations and meaningless figures around (unlike many in the business) because he realises that nobody has yet fathomed out how widespread copying has become. So his approach has been practical.

"We feel it's necessary to fight the pirates collectively. So we've joined the Guild of Software Houses, and we contribute to its legal fund to authorise solicitors to press charges against any pirates we find. It's not possible to pursue it on your own."

In any case, Meakings may have a solution of his own.



Bubble Bus duplicates all its tapes in-house, which has obvious advantages: no long delays from duplicating companies are incurred, production can be stepped up easily for increased demand. But with its forthcoming introduction of Turbo loading, Bubble Bus has found that its own tape duplicators no longer work. So this should pretty well deter the home copier.

Still, if pirating exists on an organised basis (as is constantly claimed) that obstacle will not be unsurmountable.

bubble bus software

Taking the blame

Obviously Meakings holds strong opinions on piracy but he's perceptive enough not to aportion total blame for the industry's current plight to illegal copying. "Going to the wall has a lot to do with business and marketing strategies – companies committing themselves to huge budgets and overheads. Too many people feel that whatever they do will be successful because they've been successful in the past. It's a case of people keeping their heads. There will always be a market for good-quality games."

That's illustrated by the importance of good reviews in the computer press: "Reviews can have a big impact on sales". That's certainly true for Bubble Bus, which has had consistently good reviews. And it means a lot to Meakings. "We know that we can sell on the strength of past products. A lot of our market exists from people who've bought us before."

Meakings has already witnessed examples of crazy marketing strategies; one of them concerns his own *Hustler* game. Bubble Bus sold it to American software house HesWare under licence to be marketed under the ponderous name *Minnesota Fats Pool Challenge*. Thorn EMI Computer Software is now selling the complete HesWare range, including *Minnesota Fats*, in this country ... at £9.95. *Hustler* costs only £6.95.

When Meakings found out this was happening, to prevent people buying both copies he insisted that a note should appear on the insert stating that the game was originally written by Bubble Bus and that it's also known as *Hustler*. The second condition hasn't been fulfilled, so Meakings won't be continuing with the deal.

The games go on

But pirates and stories of decreasing sales cannot deter



software houses from getting on with the day-to-day task of producing new games and selling as many as possible. Most of Bubble Bus's programmers are now working on new projects; plans include a 3D adventure game which Meakings reckons will be better than *Valhalla*.

All those will appear for the 64 which Meakings feels still has a great deal of life in it. "There's a lot more to be got out of the 64 – we haven't reached the limit yet", he asserts confidently.

New machines

A new departure will be work on the Spectrum and the upcoming clutch of MSX machines.

And on the subject of new machines, Commodore's latest 16 and Plus 4 models have just appeared – at long last. What are Meakings' views on those?

"We've not taken the final decision to program on those yet, but we have our doubts." Those doubts are especially aimed at the 16. "Lots of kids are looking at bigger machines than the 16 with its tiny 16K memory. We weren't impressed by it." There's a general consensus of opinion on that score.

Obviously the Plus 4 presents more of a challenge, but Meakings will probably wait until it's available in the shops before going any further with it. The reason for that being that Commodore gets marketing rights for any software written on pre-release development machines.

Generally, Meakings detects some confused thinking within Commodore as to the purpose of these new offerings. The 64 continues to sell very well and an obvious ploy would have been to decrease its price and to further strengthen its market lead. That probably won't be happening now.

Meanwhile, Bubble Bus is in the process of carving an international market for itself. Meakings recognises that America "is a tough nut to crack", but Europe holds more potential and Bubble Bus has already started selling there. "You can't be insular any more", asserts Meakings, "overseas sales used to be just extras; now it's becoming increasingly important". That's going to mean a lot more overseas business trips for him – maybe that's not a bad thing.

A bigger Basic – Arrays and Dim

by Chris Preston

Few things seem to cause more problems to beginners in programing, while at the time being extremely useful, as the array. Yet it is in fact quite simple to understand, and shouldn't really be able to frighten anybody.

Before looking at arrays though, it will pay to very quickly go over the basis for ordinary variables (called *simple* variables). We can draw a picture of a simple variable as a little box with a name and a value.

NAME	VALUE
A	15

In this diagram, the value of the variable A is 15, so presumably then we have already given the variable a value, as in the following statement:.

```
1450 A = 15
```

Now let's look at a typical programming problem. We have a student in a class who has just taken an exam, and we want to store her marks in a variable **M**. We can use an INPUT statement to enter the value like this:

```
100 REM
100 INPUT "ENTER
    MARKS"; M
```

Now, one makes a very small number to have in a class. What if we have three students? We can have three variables, M1, M2 and M3 to hold the scores for the three examinees:

```
10  REM Program No.2
100 INPUT "MARKS FOR
    FIRST STUDENT"; M1
110 INPUT "MARKS FOR
    SECOND STUDENT"; M2
120 INPUT "MARKS FOR
    THIRD STUDENT"; M3
```

This looks quite reasonable. But what if we have a more realistic class with says 40 pupils? It is going to be a bit tedious typing in forty different INPUT statements, and just try to imagine the equation to calculate the average of the marks!

Of course the solution is simply to use an array, which is what we have been working around to all the time.

Let's stick to three schoolkids for the time being. **Figure 2** is a diagram of an array **M()** set up with three elements, **M(0)**, **M(1)** and **M(2)** so that it can hold the marks for three students; in fact those marks are 67, 23 and 48.

NAME	VALUE
M(0)	67
M(1)	23
M(2)	43

This is really just the same as having three separate variables, M1, M2 and M3. The number inside the brackets is called the *array subscript*, and it identifies which element of the arrays we are going to use. So if we say ...

```
PRINT M(1)
```

... we are in fact selecting the *second* element of the array, and we will get the answer 23. Notice that we can use array references in exactly the same way as we do simple variables – in equations, PRINT statements, and so on. This means that we can rewrite Program No. 2 using our three array elements:

```
100 INPUT "MARKS FOR
    FIRST STUDENT"; M(0)
110 INPUT "MARKS FOR
    SECOND STUDENT";
    M(1)
120 INPUT "MARKS FOR
    THIRD STUDENT"; M(2)
```

If it bothers you to have the first element in an array numbered zero (yes, it is called the 'zeroth' element!), then forget about it! If you need ten elements, there is no reason why you should not use an array with *eleven* elements numbered 0 to 10, and ignore the zeroth element.

Progress to date

So far we have got an array with three elements, M(0), M(1) and M(2), and we have stressed the point that you can consider these in exactly the same way as three separate simple variables. So what is the advantage? Well the heart of the matter is that the subscript can be a variable, so we can say:

```
Program No. 3
10 REM
20 FOR I = 0 TO 2
30 PRINT M(I)
40 NEXT
```

Now we can see the huge advantage of using arrays instead of simple variables in cases where we have a number of related values, such as the marks to the children in a class. This program is not going to get any larger if we increase the number of pupils from three to thirty – all we have to do is change line 20 to read:

```
20 FOR I=0 TO 29
```

Now let's modify Program no. 2 to input the marks for forty pupils:

```
10  REM Program No.4
100 FOR I=0 TO 39
110 PRINT "ENTER MARKS
    FOR PUPIL"; I; ""
120 INPUT M(I)
130 NEXT
```

Now if you try to run this program, you will find that when I=11 you get problems: Basic will give you a BAD SUBSCRIPT ERROR.

The problem is that you have not told Basic how big the array M() is, how many elements it has. In this case Basic assumes that eleven elements (0 to 10) will be enough, so it allocates sufficient space to the array for these elements. When you tried to access element M(11), Basic gave you the error. What we have to do is tell Basic how large the array is by using the **DIM** statement:

```
50 DIM M(39)
```

This tells Basic that we are going to use an array M(1), and the maximum subscript is going to be 39. It is in fact good practice *always* to declare your arrays at the start of the program. It saves space with small arrays (because they are only allocated three elements instead of 11) and it also helps you to remember how big the array is.

After adding line 50 the program *will* run; but it is a bit dry, asking for the marks for "pupil 15" and "pupil 18". How can we make it more human? By giving the pupils names. We can store the names in DATA statements at the end of the program, and read them into a string array:

```
10   REM Program No.5
100  DIM P$(39), M(39)
110  FOR I=0 TO 39: READ
     P$(I) : NEXT
120  FOR I=0 TO 39
130  PRINT "ENTER MARKS
     FOR"; P$(I); "";
140  INPUT M(I)
150  NEXT
200  FOR I=0 TO 39 : T = T
     + M(I) : NEXT
210  AV = T/40
220  PRINT "THE AVERAGE
     MARK FOR FORM 4A
     IS"; AV
1000 DATA "RICHARD
     ADAMS", "PERCY
     BLAKENEY",
     'CLAUDIA
     CARDINALE"
...  etc.
```

Quite a few things to look at here! Line 100 shows that we can dimension more than one array in one statement, and that we can have string arrays (we can also have integer arrays such as R%(), we will mention these later). In line 110 we read all the pupils names into a string array P$(), so that the input prompts become a little bit more friendly:

ENTER MARKS FOR HAROLD WILSON?

Lines 200 and 220 calculate and print the average mark.

Another DIMension

Now for an extra dimension: what if the headmaster, greatly impressed by our work with Form 4A, wants to extend the program to cover 4B, 4C and 4D? Do we have four arrays, one for each Form? No, there's a better way: we have one array with two dimensions.

```
10  REM Program No.6
100 DIM M(39,3)
110 FOR I = 0 TO 3 : FOR J
    = 0 TO 39
```

Gala Soft

Gala Games: CBM64 – Runnin, Jumpin 'n stuff like that, the games the Americans didn't win. On disk £9.95 + 50p p&p. Phone: 0268-682719 for tape availability.

Cheques/Postal Orders to: Gala Soft, 116 Church Parade, Canvey Island, Essex SS8 9RH. Enquiries welcome.

COMMODORE 64 DATABASE DATAFILE

Powerful options include: Print all/selective records, delete, amend, save, load, copy, alphanumeric sort, user definedfields, memory check, total numeric fields, multifield interrelational, global and between limits searches etc. Fully Menu driven with comprehensive easy to use instructions. Disk and cassette fully compiled. (Can be used with 1515, 1525, 1526 GP 100VC, MPS 801 printers and 1520 printer/plotter if required.)

Outstanding value:- cassette £7.45, disk £10.25 fast delivery by first class mail. Send cheque/postal order to:-

A+C Software, 51 Ashtree Road, Tividale, W Midlands B69 2HD

Y-E-S Vic 20 & 64

SALES & SERVICE

COMPUTERS

SAY YES FOR COMMODORE HARDWARE, SOFTWARE & PERIPHERALS

YORKSHIRE ELECTRONICS SERVICES LIMITED

Caxton House,
17, Fountain Street,
Morley, West Yorkshire
Tel: 0532-522181

WE WRITE & RUN OUR SOFTWARE!

Professional Word processor for the Commodore 8032/96 & 8050/8250 Disk Drive

Fast entry & editing (all programs compiled), Index File Storage, Sorting & Listings, On screen right justification, Tabulations, Calculations, Supports up to 5 printers, Makes use of up to 15 different print types on each, Append documents, etc...

Wordwrite 32/96 complete with manual £150.00
Wordwrite 32/96 + Quality Juki 6100 Daisy Wheel Printer £560.00 *Prices Include VAT & Postage & Packing.*

BRENDON SOFTWARE, Brendon Edge, Huish Champflower, Wiveliscombe, (Tel [0984] 23386), Taunton, Somerset TA4 2EY.

TRIDENT ENTERPRISES

UPGRADES

1541 & 1540 £40.00 Incl Parts
2,3,4000 Computers £70.00 Incl Parts
2,3,4000 Floppies £97.50 Incl Parts

COMMODORE REPAIRS

Vic-20's £12.50 – Parts
C64's £15.00 – Parts
1541 & 1540 Floppies £20.00 – Parts
8000 Series Computers £40.00 – Parts
8000 Series Floppies £40.00 – Parts

FIELD SERVICE

40 Miles Radius of Slough on Business Systems (Telephone for further details)

We also repair BBC's and Spectrums

Send your machine with a brief description of faults to: Trident Enterprises Ltd, 37 Linden House, Common Road, Langley, Slough, Berks SL3 8TT (0753 48785)

(The above prices are Exclusive of VAT & P&P)

Commodore 64 + Vic-20 Club

All original software – business and games. New releases for CBM64 every two weeks.
Send your name and address to go onto our mailing list.

M.J. Seaward
St Olafs Road, Hill Head, Stratton, nr Bude, Cornwall.
Telephone: Bude 4179.

THE NAUGHTIEST THING YOUR CBM64 EVER DID!

LOVE BYTES!

AN ADULT GAME OF FORFEITS AND REWARDS FOR TWO PEOPLE – ON CASSETTE £5.95

OVER 13000 POSSIBLE COMBINATIONS, YOU MAY GET TIRED PLAYING IT BUT YOU'LL NEVER GET TIRED OF IT!

HARBOUR SOFTWARE: 134 EAST WEARE RD PORTLAND DORSET (OVER 18's ONLY)

At last!

NUMERIC KEYPAD



for CBM64 & Vic-20
Essential for the serious of business user. NO SOFTWARE REQUIRED: simply fits in parallel with the keyboard. Always ready to use. High quality, gold contact key switches for long reliable life. Includes return key and 1 metre of cable.

Now available at introductory price of £28.75 (inc VAT) & £1.00 p&p. Please send cheques/PO to: COMMERCIAL PRODUCTS, 11 Hylands Close, Furnace Green, Crawley, Sussex RH10 6RX.

COMMODORE 64 THREE SUPERB UTILITIES

No. 1 Tape Back-Up Utility This will assist the user to make personal security copies of their software onto tape or disk. Two versions available on one tape. £4.99

No. 2 Tape to Disk Utility This will assist the user in transfering their software from cassette onto disk. Features include change or insert a filename. Just £4.99

No. 3 Tape Header Reader A full feature 3 stage utility. A must for all serious CBM64 owners. Priced at only £3.75 and will also compliment the above two programs.

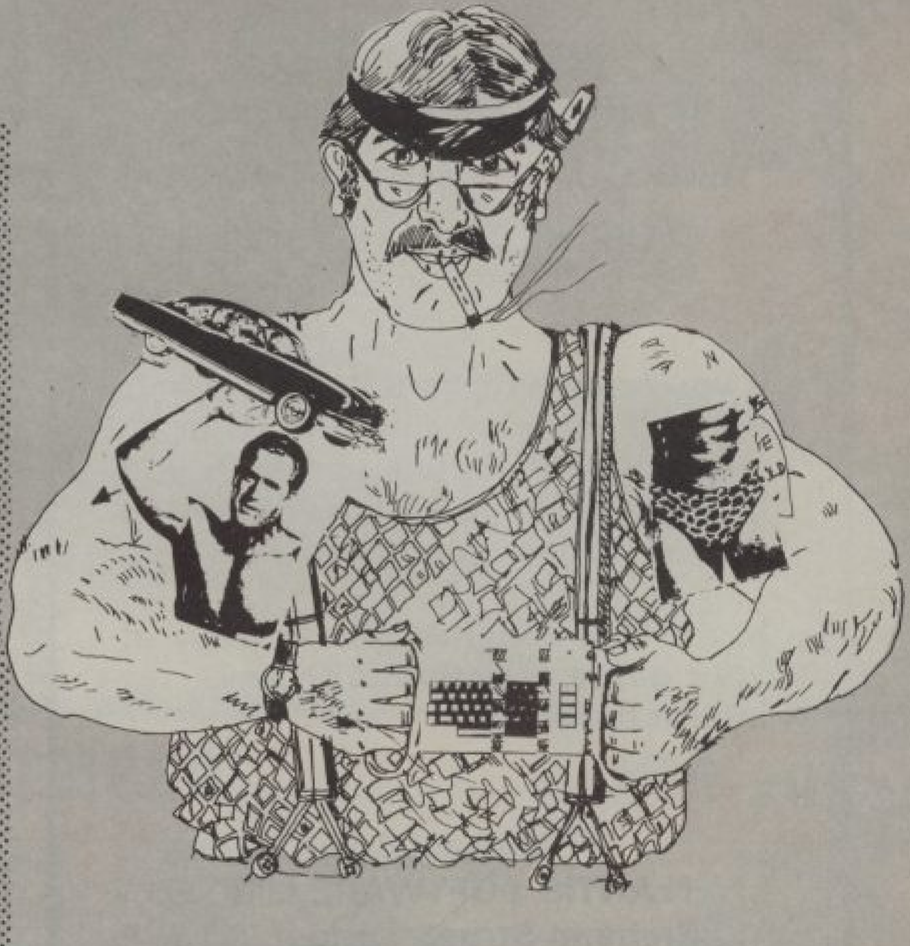
All programs are supplied on a quality data cassette and with full written instructions. Available on disk at £2.00 extra per program. Sent by first class post, send cheque/PO, or sae for full details to:

Clark Kent Software,
26, North Cape Walk, Corby, Northamptonshire NN18 9DQ.

CARTRIDGE CITY
COMMODORE 64 CARTRIDGE RENTALS

- ★ Choose from a rapidly growing range
- ★ Descriptive catalogue
- ★ Yearly membership only £5
- ★ Hire rate from £1.50 for 10 days
- ★ First hire FREE
- ★ Big discounts on software and hardware
- ★ Monthly Star Program Offer

Large SAE appreciated for details:
CARTRIDGE CITY, Dept. C,
25 GAITSIDE DRIVE, ABERDEEN AB1 7BH.
or phone: (0224) 37348



```
120 READ P$(J,I) : NEXT :
    NEXT
130 FOR I = 0 TO 3 : FOR J
    = 0 TO 39.
140 PRINT "ENTER MARKS
    FOR"; P$(J,I);"";
150 INPUT M(J,I) : NEXT :
    NEXT
... etc.
```

We can consider the two-dimensional array M(,) as four single-dimensional arrays of 40 elements each; or as a rectangular array, with the first subscript giving the row number and the second the column.

Stand up that boy who scored 0!

The trouble is that our head is too keen for words. Now he wants to include the Third and Fifth Forms as well. No problem: we add another dimension, whose value, 3, 4 or 5 tells us which year we are talking about...

100 DIM M(39,3,5)

We can consider this as a series of pages in a book each of which has a rectangular array like **Figure 3** drawn on it, in which case the third subscript becomes the page number. At this point, though, it is probably better to forget about drawing physical models of the array, and just think of the three subscripts as being keys which select the right 'box':

M (pupil, stream, year)

There is in fact no limit in Basic as to the number of dimensions. But multi-dimensional arrays eat up memory, so a practical limit is probably four:

M (pupil, stream, year, school)

How can we have a four-dimensional array without delving into science fiction? Well, as far as the Vic or the 64 are concerned, no matter how many arrays we have the elements are stored one after the other in memory – in a line, almost – and the machine calculates where any element is by a clever equation using the information in the DIM statement.

J \ I	0	1	2	3
0	72	64	61	56
1	47	68	44	38
2	65	51	48	40
3	59	70	53	44
4	80	23	18	32
5	75	61	56	0

M (J,I)

Integer arrays

One last point which is well worth mentioning is the use of integer arrays. You may have heard it said that there is no point using integer variables because, contrary to what you might expect, they take up more memory and are slower. This is quite correct: while some versions of Microsoft Basic *do* have true integer arithmetic, the Commodore Basic just converts any integer value to floating point before using it. That takes time; and the variables still take up seven bytes in the variable table, which means that all those % signs are just wasting bytes.

When it comes to arrays, however, you can get a large space saving (although you are still stuck with the speed penalty) by using integer arrays: **DIM A (1000)** takes approximately 5,000 bytes, **DIM A% (1000)** takes approximately 2,000 bytes. Quite a saving!

There are a few things which can go wrong when you are using arrays. It you dimension an array to have 15 elements...

DIM A(14)

... you cannot then say **PRINT A(22)**. All that will happen is that you will get a BAD SUBSCRIPT ERROR.

Resizing arrays?

Also, once you *have* declared an array, you cannot change its size: there is no way to make it larger, or disappear altogether to release some space. If you try to dimension an array more than once you will get the message REDIM'D ARRAY.

This can also happen if you use an array and then try to declare it:

```
10  A(5) = 50
20  DIM A(30)
```

This is because at line 10 Basic dimensions A() itself, so line 20 just causes an error. You *must* dimension an array before using it.

One last error, which is much more difficult to spot, is forgetting to initialise one element of an array. For instance:

```
10   FOR I = 0 TO 5 : A(I) =
     5 : NEXT
1450 FOR I = 0 TO 6 : A(I) =
     A(I) + 1 : NEXT
```

Notice that the two FOR-loops have different ranges? Another reason for dimensioning *all* arrays, so you know just how big they are.

Hopefully this article will have stripped some of the mystique from the business of using arrays. There really is nothing to it once you get the knack, and it is almost impossible to write any sort of real program without using them.

CHART UPDATE

SEPTEMBER

CBM64

Pos	Last	Title	Publisher
1	(1)	Beach Head	US Gold
2	(2)	Valhalla	Legend
3	(5)	Arabian Nights	Interceptor
4	(9)	Encounter	Novagen
5	(7)	Cavelon	Ocean
6	(-)	Aztec Challenge	US Gold
7	(17)	Blagger	Alligata
8	(4)	Loco	Alligata
9	(13)	Flight Path 737	Anirog
10	(3)	Hulk	Adv. Int.
11	(8)	Solo Flight	US Gold
12	(15)	House of Usher	Anirog
13	(-)	Manic Miner	Soft Proj
14	(12)	Son of Blagger	Alligata
15	(14)	Caverns of Khafka	Cosmi
16	(11)	Sheep in Space	Llamasoft
17	(10)	Chukkie Egg	A&F
18	(–)	Twin Kingdom Valley	Bug Byte
19	(6)	Space Pilot	Anirog
20	(-)	Alice in Videoland	Audiogenic

TOP 3 MANUFACTURERS:

US GOLD
ALLIGATA
ANIROG

VIC-20

Pos	Last	Title	Publisher
1	(1)	Flight Path 737	Anirog
2	(6)	Jet Pac	Ultimate
3	(2)	Chariot Race	Microantics
4	(-)	Arcadia	Beau-Jolly
5	(12)	Flight 015	Ferranti
6	(-)	Jack Pot	Mastertronic
7	(5)	Snooker	Visions
8	(9)	Bongo	Anirog
9	(10)	Tank Commander	Creative Sparks
10	(-)	Spiders of Mars	Audiogenic
11	(4)	Duck Shoot	Mastertronic
12	(-)	Lazer Zone	Llamasoft
13	(17)	Sub Commander	Creative Sparks
14	(-)	Scramble	Anirog
15	(-)	Krazy Kong	Anirog
16	(14)	Wiz and Princess	Melbourne
17	(15)	Sub Hunt	Mastertronic
18	(-)	Space Joust	Software Projects
19	(-)	Luv Bug	Thor
20	(-)	Punchy	Mr Micro

TOP 3 MANUFACTURERS:

ANIROG
MASTERTRONIC
CREATIVE SPARKS

An independent chart to best-selling games, compiled by R.A.M./C. for Commodore User, representing retail sales in independent specialist outlets referenced against distributive sources.

TOMMY'S TIPS

Tommy is Commodore User's resident know-all. Each month he burrows through a mountain of readers' mail and emerges with a handful of choice queries. The result, before you, is a wadge of priceless information and indispensable advice. There's even the odd useful tip as well.

***Dear Tommy*, Having recently entered the world of computers by purchasing a CBM 64 with 1541 Disk Drive, I have been somewhat annoyed (to put it mildly) by some of the errors I've come across.**

First of all, as a regular reader of 'Input' magazine I enter most of their programs, but recently I entered a space station program and when I ran it the screen seemed to freeze. I tried RUN/STOP and then simultaneous RUN/STOP and RESTORE but nothing worked. The effect of the 'freeze' was that the cursor disappeared from the screen and only half the keyboard, i.e. every alternative letter would function.

Similarly, after programming Forbidden City from the book by Vince Apps (which took 4 hours) I was surprised when, after about 5 minutes the keyboard locked up solid. No single key or combination of keys would free it.

As you can appreciate, in both cases I was unable to LIST the entries in order to check them.

Could you please advise on the cause and cure for this?

Furthermore, I have recurring problem editing programs already SAVEd on disk. In order to learn more about structured programming I've put together a program which I frequently alter to see the result, but I find that although the initial SAVE command worked well, I cannot successfully SAVE any amended or alternative version. Can you help?

Without knowing what the programs are and what they are doing it is not possible to state what the cure is. What is most likely is that there is an error in the program (or your typing) which has caused the program to POKE an incorrect value or an incorrect address. The resulting 'crash' could well cause the effects you have mentioned. The moral of the tale is: 'always save a program to tape or disk before running it!'. One major problem you are going to have is that without a printer it is going to be very difficult for you to debug the program on the screen. Screen debugging is fine for small programs, but one that takes four hours to type in must be fairly meaty. See if you can find someone with a printer and ask them to dump out a listing; it's the only real way of sorting out those elusive bugs.

Your second problem could well be the infamous 'Replace' bug in the 1541 ROM. Basically, if you use the **@0:filename** method of re-saving a file which is larger than the original, due to changes, then you will corrupt the disk because it overwrites parts of the disk that it shouldn't. The only way round this is to delete the old version first and then do a normal save command.

***Dear Tommy*, I write to seek your expertise on two counts. The first concerns a rather annoying bug which I find exists between my Vic-20 with 24K expansion, Commodore 1515 printer and the C2N cassette deck. I find that if I have saved a program on tape and subsequently I tried to list it on the printer I get an initial feed followed by a short pause (15-30 secs) then the cursor returns to the screen flashing normally but no further action is forthcoming from the printer despite much encouragement. To add insult to injury any subsequent input to the Vic via the keyboard (including RUN/STOP and RESTORE) merely results in no cursor and a dead machine. A situation which I have only been able to recover using the ON OFF switch. As this bug only presents itself after using the tape deck I feel there must be a store location that could be reset to allow output to the printer subsequently. Your advice please.**

The second problem I have involves the transfer of programs from the Vic-20 to the Commodore 64. Equipped with both computers a 1541 disk drive and a cassette deck is there any way to transfer programs to the 64 if they have been written for the Vic and stored on tape? If not is there any other solution to the problem short of typing them in on the 64?

Rather a strange problem this; I used an identical combination of hardware for some time without any such bug occuring. It sounds therefore as if either your Vic or printer might possibly be faulty. One way round the problem might be to press 'RUN/STOP RESTORE' *before* doing the print. If you find that the system still locks up, try switching the printer off; this sometimes releases the Vic from its apparent paralysis. In any event I suggest you contact your dealer especially if your Vic or your printer are still under guarantee.

Your second problem is a lot easier to solve. Load the programs into the Vic from the tapes and then save them on disk. The 64 will happily load the programs from disk, although you will still have to make software changes to the PEEKs and POKEs in the program before you can run them.

***Dear Tommy*, We have a Commodore 64, a Commodore 1541 and an Epson RX80.**

What do we need to receive programs from the BBC Ceefax pages? Your assistance will be very much appreciated.

Basically, what you require is a Ceefax receiver with an interface for the 64. The problem is that I do not know anyone who is currently producing such a combination. Although there are computer programs which can be downloaded, these are only for those machines such as the BBC computer for which adapters have been produced; thus even if you managed to get a hook-up I don't think you will gain much at present over a standard TV with teletext facilities built-in. If you want a more interactive database network to link into why not take a look at Micronet 800 or Compunet which give (or will give, for the latter) access to Prestel and are two-way connections, unlike Ceefax. Rumour has it that a CBM 64 interface is now available for Micronet 800. You can obtain further details by ringing 01-278 3134 for Micronet and 01-637 1355 for Compunet.

***Dear Tommy*, I have an unexpanded Vic-20 and the following runs up the screen for about two minutes. Could you tell me what to do to this program so that, at the end of it, I can find out from the computer how many times No1 appeared, how many times No2 appeared and so on up to No 50:**

```
10 FOR J=1 TO 5000
20 S=INT (1+50×RND(0))
30 PRINT S;
40 NEXT J
50 STOP
```

Hoping you can oblige

Your problem can be solved by storing the totals in an array; one element for each number. The following lines create the array and then store the numbers in the loop:

```
 5 DIM T(50)
25 T(S) = T(S)+1
```

Although RUNning a program will clear the array it is good practice to clear the array properly since not all machines do it automatically; the following line will ensure that all elements are set to zero before you start:

```
7 FOR A=1 TO 50:T(A)=0:
  NEXT A
```

To print out the totals at the end the following code is needed:

```
42 PRINT:FOR A=0 TO 17:FOR
   B=1 TO 3:TL=((A*3)+B)
44 PRINT "<RED>"; RIGHT$
   (STR$(TL),2); "<BLU>";
   T(TL);: NEXT B
46 PRINT:NEXT A
```

This will print out the values in 17 rows of 3 columns so you can see it all on one screen without it scrolling. You can smarten up the columns so they all line up if you want, but the basic structure is there for you to use. You should note that if you want a full range of numbers from 1 to 50 you must use **RND(1)** in line 20, not **RND(0)**. The latter gives neither a full range of values nor, as stated in the handbook, a repeat of the last number again. Basically, don't use **RND(0)** for anything; it doesn't work!


MICROPOWERMICROPOWERM
CYBERTRON MISSION
Fort Cyberton, the most well-protected stronghold in the galaxy. Obliterate the Spinners, Clones and Cyberdroids as you explore the 64 room complex in search of the Fort's riches. Avoid touching the walls with their sizzling high voltage charge and watch out for the relentless spook who glides through walls in hot pursuit.
£6.95. (ELECTRON and BBC MICRO versions £7.95)
commodore 64
(SUPER-FAST LOADING TIME)
electron B.B.C. MICRO
MICRO POWER
MICRO POWER LTD., NORTHWOOD HOUSE, NORTH STREET, LEEDS LS7 2AA TEL: (0532) 458800
SELECTIVE BRANCHES OF BOOTS, CO-OP, MENZIES, W. H. SMITH, WOOLWORTHS AND ALL GOOD DEALERS.
AUTHORS! WE PAY 20% ROYALTIES!
SWOOP, GHOULS AND FELIX IN THE FACTORY ARE ALSO IN THE SHOPS, AND THEY'RE AVAILABLE NOW!

Dear Tommy, The first aspect of the Vic that I came across was POKE (and therefore also PEEK). I gained an understanding of this using the screen character codes and colour codes memory maps in the manual. But when I plugged in my 16K RAM pack I found these codes did not work. I understand that with the addition of extra memory these codes must have changed but I have not been able to find out what the new values should be. Any help would be gratefully received.

When you add 8K or more RAM to the Vic-20, the following changes take place:

- start of screen memory moves from **7680** to **4096**
- start of colour map moves from **38400** to **37888**
- start of Basic moves from **4096** to **4608**

It is regrettable that having made a machine whose moving memory map would make Houdini confused, Commodore failed to give any help to users in the manual; you will have to buy either the Programmers Reference Manual or one of the many books on the Vic to really learn how to play around with PEEKs and POKEs with any confidence.

***Dear Tommy*, Could you please tell me if there is such a thing as a complete Memory Map for the 64, that not only gives the POKE locations, but the values to be typed in after them. For example POKE 808,251 switches off the RUN/STOP key, but what other numbers can be used with POKE 808, and all the others. I've tried finding out for myself on my 64 but this causes it to crash quite a lot, and I don't like switching on or off too much.**

Also I find that if I use abbreviated keywords after a REM statement, when listed these are all confused and not what should have been listed. Can you tell me if this is normal on the 64, if it should not be used in REM statements, or if my 64 is faulty? Thank you very much.

I regret to say that I am not aware of any publication that would contain the information you are after. One obvious problem is that there are 255 possible numbers to Poke into each location, only a few of which do anything useful. It would take quite a lot of time and paper to produce all the usable ones and would probably only appeal to a few people since most of the common ones such as POKE 808,251 are regularly published in columns such as these. What most of the numbers do is to send the program to an address where a machine code routine is held or to a 'jump table' which itself contains the address of a m/c routine; obviously it is possible to put your own m/c program somewhere and alter the numbers to jump to that instead, in which case the numbers depend entirely on the memory location required.

On your second point, if you use an abbreviated keyword it is 'tokenised' in the same way as a normal keyword. However, in a REM statement, keywords are not tokenised when input; unfortunately the token conversion routine does translate all characters which are greater than 128 (not within quotes) back into normal keywords when doing a listing. Since the second 'shifted' characters are all stored as 'ASCII value + 96' they look like tokens and are translated as such. This is a 'Bug-in-the-ROM' problem and it is not therefore advisable to use abbreviated keywords in REM statements.

***Dear Tommy*, I have a Vic-20 and a CBM 64 and I would like to know how I can get hi-res multi-colour characters, for example: a 2x4 character man with brown hair, pink face, yellow body and blue trousers with black shoes, (not sprites) or some other character with two or more colours.**

What you need to use is the multi-colour character mode which gives you a choice of four colours per 8x8 dot character position.

These colours are specified in certain memory addresses, but there are one or two limitations; three of the colours are set for all characters (in this case, pink, blue and white) with the fourth colour being changeable for each character position. One restriction on the 64 is that only the first eight colours are available for this fourth colour; hence the man drawn by the program has *black* hair, not *brown*!

The second restriction is that the effective horizontal resolution is halved since it requires two bits to define one or four colours; each single character is therefore made up of 4x8 'pairs' of pixels, rather than the normal 8x8 pixels. The following program will produce what you require on the 64; provided you have access to the Reference Manuals for both machines it is relatively easy to convert to the Vic. Note that in order to keep the character set in the same 16K 'page' as the screen without losing all your memory, the program also moves the screen area into the spare 4K memory space above the Basic ROM. ■

```
10 CH=49152:SR=50176:REM START ADDR OF 4K AREA(CH) & CHAR SET(SR)
20 FORA=2048TO3071:POKECH+A,32:NEXT:REM CLEAR NEW SCREEN AREA
30 POKE56334,PEEK(56334)AND254:POKE1,PEEK(1)AND251:REM SWOP CHAR SET IN
40 FORA=0TO511:POKECH+A,PEEK(53248+A):NEXTA:REM TRANSFER CHARS
50 POKE1,PEEK(1)OR4:POKE56334,PEEK(56334)OR1:REM SWOP CHAR SET OUT
60 REM MOVE VIDEO BANK TO TOP 4K
70 POKE56578,PEEK(56578)OR3
80 POKE56576,(PEEK(56576)AND252)
90 REM SET ADDRESS OF START OF SCREEN AND CHARACTER SET
100 POKE53272,(PEEK(53272)AND15)OR32:POKE53272,(PEEK(53272)AND240):POKE648,200
110 POKE53270,PEEK(53270)OR16:REM SET MULTI-COLOUR MODE
120 POKE53281,1:POKE53282,6:POKE53283,10:REM SET MAIN 3 COLOURS (WHT,BLU,PINK)
130 FORA=0TO63:READ DD
140 POKECH+A,DD:NEXTA
150 FORA=0TO7
160 READSP:READCP:READCL
170 POKESR+SP,A:POKECP,CL
180 NEXTA
190 GETA$:IFA$<>" "THEN190:REM PRESS SPACE TO END PROGRAM
200 END
210 REM DATA FOR THE 8 CHARS TO MAKE MAN
220 DATA3,14,10,38,42,10,8,2
230 DATA192,176,160,152,168,160,32,128
240 DATA15,63,255,255,207,207,207,207
250 DATA240,252,255,255,243,243,243,243
260 DATA207,143,133,5,5,5,4,4
270 DATA243,242,82,80,80,80,16,16
280 DATA4,4,4,4,4,60,252,204
290 DATA16,16,16,16,16,60,63,51
300 REM ADDRESSES FOR CHARACTERS & COLOUR MAP + 4TH COLOUR
310 DATA1146,55418,8,1147,55419,8
320 DATA1186,55458,15,1187,55459,15
330 DATA1226,55498,15,1227,55499,15
340 DATA1266,55538,8,1267,55539,8
```

New for your CBM 64

Sunday League Cricket simulation game

HIT AND RUN

30 players to choose from giving thousands of different permutations for team composition. One or two player game (in fact the whole family could join in to decide tactics etc.)

Sunday league rules:- 40 overs per innings.

Bowlers are limited to eight overs and may not bowl more than two successive overs.

Conditions vary from match to match. Wides, byes, no ball, etc included.

HIT AND RUN

cassette £7.95 (plus 50p PP)
disk £9.50 (plus 50p PP)

Send S.A.E. (marked '64') for full lists of 64 software (Leisure, Educational and Business).

BYTEWELL, 203 COURT ROAD, BARRY, S. GLAMORGAN CF6 7EW.

DON'T JUST PLAY GAMES!

EDUCATIONAL SOFTWARE

for the

VIC-20 UNEXPANDED

Physics	O level/CSE Revision Aid
Biology	O Level/CSE Revision Aid
Maths	CSE Revision
Computer Studies	O Level/CSE Revision Aid
Science	Revision 12/14 Years
Maths	Revision 12/14 Years
Mathematics	Revision 8/11 Years
Arithmetic	Revision 7/10 Years
Reasoning	11+ Revision
Knowledge	Quiz 9/99 Years

Exceptional value at just £4.95 each post free

Immediate delivery by first class post

NO EXPANSION RAM NEEDED

Cheques/PO to:
Micro-De-Bug Consultancy
Dept CU, 60 Sir John's Road
Selly Park, Birmingham, B29 7ER
Tel: 021 472 7610

DEALER ENQUIRIES WELCOME

Superbase 96

THE COMPLETE INFORMATION STORAGE AND CONTROL SYSTEM. SUPERBASE 96 TRANSFORMS COMMODORE MODEL 8096 OR 8296 INTO A FULL-FEATURED, PROFESSIONAL DATABASE SYSTEM! WITH UP TO 1100 CHARACTERS PER RECORD ON UP TO 4 SCREENS... AND UP TO 128 ITEMS PER RECORD, DEFINABLE AS KEY, TEXT, NUMERIC, CONSTANT, RESULT OR DATE... IN FILES OF UP TO 16M CHARACTERS! WITH SPREADSHEET AND CALCULATOR CAPABILITY, CALENDAR FUNCTIONS, MULTIPLE CRITERIA SORT AND SEARCH, EASY INPUT FROM WORDPROCESSOR/DATA FILES, BOTH MENU-DRIVEN AND PROGRAM OPTIONS, BATCH AND TRANSACTION PROCESSING, FULLY DEFINABLE OUTPUTS... SUPERBASE 96 IS ESSENTIAL IF YOU WANT THE MOST FROM YOUR COMMODORE! SUPPLIED ON 8050/8250 DISK, WITH EXCELLENT TUTORIAL/REFERENCE MANUAL. OUR PRICE ~~£454.75~~ £375.00!

Superscript II

SUPERSCRIPT II HAS ALL THE FEATURES YOU EXPECT FROM A PROFESSIONAL WORDPROCESSOR SYSTEM... AND THEN MORE! UNRIVALLED 240-COLUMN TEXT HANDLING, VARIABLE WIDTH SCREEN, FOUR-WAY SCROLLING OVER 2100 LINES, DOCUMENT LINKING FOR UNLIMITED CAPACITY, GLOBAL SEARCH AND REPLACE, FULL MEMORY CALCULATOR, ROW AND COLUMN ARITHMETIC, BACKGROUND PRINTING AND COMPLETE LETTER-QUALITY PRINT CONTROL MAKE SUPERSCRIPT THE ULTIMATE WORDPROCESSOR FOR THE CBM 8096/8296... AND IT SPELLS TOO! SUPPLIED ON 8050/8250 DISK. OUR PRICE ~~£454.25~~ £375.00!

Master

THE COMPLETE PROGRAM DEVELOPMENT PACKAGE FOR THE COMMODORE 8096/8296. USED BY BOTH NOVICE AND PROFESSIONAL PROGRAMMERS. MASTER ADDS 85 NEW COMMANDS TO BASIC INCLUDING 72K MEMORY MANAGEMENT, PROGRAMMER'S TOOLKIT, BUSINESS BASIC, KEYED DISK ACCESS, MULTIPLE SCREENS WITH USER-DEFINABLE INPUT ZONES, REPORT GENERATOR, 22-PLACE ARITHMETIC, DISK DATA COMPRESSION, DATE CONTROL, SCREEN PLOT, SCREEN DUMP, AND MORE... EVERYTHING YOU NEED FOR PROGRAMMING TO TOP PROFESSIONAL STANDARDS! WITH COMPREHENSIVE INDEXED USER MANUAL, QUICK REFERENCE CARD AND DEMOS. OUR PRICE ~~£339.25~~ £225.00!

*** WANT IT TOMORROW? *** CALL US TODAY! *** ON 01-546-7256

8032 TO 8096 UPGRADE	~~£346.00~~	£287.50	SUPEROFFICE 8096/8296	~~£799.25~~	£650.00
PM96 8096/8296	~~£114.53~~	£86.25	SUPERSCRIPT 4032/8032	~~£286.35~~	£225.00
VISICALC 8096/8296	~~£228.85~~	£195.50	SUPERSPELL 4032/8032	~~£172.50~~	£135.00
DTL COMPILER	~~£114.53~~	£109.00	SUPERSCRIPT 700	~~£517.50~~	£425.00
MASTER 700		£339.25	SUPERBASE 700	~~£517.50~~	£425.00

PRICES INCLUDE 15% VAT AND ARE CORRECT ON GOING TO PRESS. ORDER BY POST OR PHONE, USING CHEQUE, ACCESS/BARCLAY CARD OR OFFICIAL ORDER. DESPATCH IS BY SAME-DAY 1ST CLASS POST, PRE-PAID ORDERS FREE. PRODUCT DATA AVAILABLE ON REQUEST. REF A29

VISA

Calco Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY, KT2 7QT. TEL 01-546-7256

CASSETTE INTERFACE FOR YOUR CBM 64/VIC 20

SENSATIONAL OFFER!

Use your own portable cassette recorder with your Commodore 64 or Vic 20 computer

LOOK AT THESE FEATURES:—

- ☐ Extremely reliable — one of the few cassette interfaces to actually work!
- ☐ Full remote motor control
- ☐ LED indicator for precise volume setting — no more trial and error recording!
- ☐ High quality plastic casing
- ☐ Supplied complete with leads, connectors and full instructions
- ☐ Full 1 year's guarantee by renowned manufacturer



Amazing value for only £9.95
Send now while stocks last!

To: Sevens, 15 Eastmead, Farnborough, Hants.

Please forward me .... Cassette Interface(s)

Name .... Address ....

....

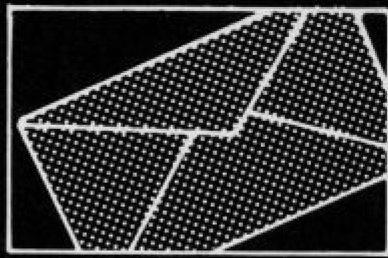
All prices are inclusive of VAT
MAIL ORDER ONLY. DELIVERY APPROX. 7 DAYS

Please debit my Access
Card Number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

I enclose Cheque PO for £ ....

Write away

This is your page: normally we write for you, but here we listen. Feel free to let us know what you think – about the magazine, about Commodore, about suppliers, about life, art, the meaning of existence or whatever. We don't print everything we receive, of course; but anything that might be of specific relevance or general interest will make it to these pages.



Spilling the beans on Karn

In reply to Ian McCooey's letter concerning *Heroes of Karn:* (**Commodore User**, July) you must take the pot of honey beside the piece of meat and proceed to the marsh where the frog is found. Light the gas which will kill the swamp lizard, take the frog and kiss it! After doing this, proceed east to the bear and give it the honey. This will enable you to find the gates of Karn. After a little experimenting and locating of certain objects you will discover the significance of saying "Orion" and how to find the bottle. Hopefully I have not given too much away to spoil the adventure for anyone!

Derek Cargill, 62 Windmill Road, Kirkcaldy KY1 3XG.

Warrington club call

First congratulations on a great magazine. I have had a 64 for about three months now and am really getting into it (not literally). Could you or any of your readers tell me if there is a 64 users club in or very near Warrington?

P. Taberham, 29 Linden Close, Woolston, Warrington, Cheshire WA1 4EW.

Variable re-count

In the July '84 issue you gave an incorrect answer to the £1,000 Competition question on the number of possible variables (shame on you).

You forgot (or were ignorant of the fact?) that **FN, ON, TO, IF, GO** and **OR** can not be used as variable names because they are Basic keywords. These six names give thirty six illegal variables so the answer should have been 5733 rather than 5769 (how about giving me the £1,00 prize instead).

Also, how about a few more '64 victuals. There seems to be a lot more for the Vic than the greatly superior 64.

Anyway, apart from these quibbles I find it a really good magazine: informative, interesting, lively, amusing... and good value for money. I particularly liked Butterfield's Series on the 64 video. As a suggestion for future articles how about reviewing some Vic/64 Flight Simulators and even offering a good one in your Deals for Readers section?

Richard Phipps, 23 Lancaster Drive, Paignton, Devon.

We're reviewing a whole batch of simulators in the next issue – Ed

Not-so-simple Simon

I have not yet seen in your magazine any problems relating to the Simons' Basic cartridge. I have a few queries about it. Firstly the *Design*-command used for sprites does not seem to work correctly. After typing in the example program from the manual, the program runs once then fails to run again; it won't even list. The command illustrated is **Design 0,2048**.

Also can the user-defined graphics Design command be used to create multi U.D.Gs, and can U.D.Gs be used on a hi-res screen?

I live in the middle of nowhere and don't know anybody else with a Commodore 64. I have tried Commodore but as per usual to no avail.

T. Waterhouse, 114 Hudrake, Haslingden, Rossendale, Lancs BB4 5AF.

Rossendale isn't quite in the middle of nowhere. Still, can any Simons' Basic aficionados come to the rescue?

Simon, yet again

I am writing concerning something published in your magazine about a list bug in Simons' Basic (Feb & March 84). First in Tommy's Tips then in the news page instructions were given to obtain a listing to printer; however I would like to pass on to other readers that I have never had to do this, the instructions in the printer manual work ok. This is with MPS 801 printer. Perhaps this has something to do with it.

Secondly I would like to congratulate you on including the analogue clock in Simons' Basic in the May issue, I'm sure I'm not alone in hoping to see more programs in future using this package.

The third thing may seem like an odd question but there are times when I would like to exit Simons' Basic without unplugging the cartridge (simply to avoid plugging and unplugging all the time to save wear and tear on the cartridge edge connector).

I realise this will mean using a switch as the Game, ExRom and Power line need interrupting. I wonder if any reader can offer advise on this. The main problem is getting inside the cartridge, could you tell me if these are glued or is it possible to part it or is it necessary to break it?

Dale Stammers, 16 Windsor Drive, Houghton-le-Spring, Tyne & Wear.

The reviewer reviewed...

Referring to the recent review of games in your issue dated July 84 for *Neoclypse* for the Commodore 64. We would in all honesty believe that LS must have had a good meal before reviewing it, work for the company who make the program, or be 'Wally of the Week'!

Whilst we appreciate people's taste and opinions of games vary dramatically, on the strength of the overwhelming remarks made we bought the cassette.

Oh dear: even in our limited experience it falls far short of *Defender* on Atari VCS and similar games on our previous computer, the Vic-20.

On a more general note we are



concerned with some of the poor quality of games for computers on the market at present. There is, very often, little chance of seeing the game on display and one's choice is very often determined by comments and opinions expressed in magazines such as yours. Bearing in mind that in many cases young people in particular, could have saved to buy new games, this is unacceptable.

Come on games writers and companies, we need more examples such as *Beach Head* and *Space Pilot* to name two of the best. No wonder these are No 1 and No 2 in the charts. If one or two companies can do it at very reasonable prices so can the rest. There are obviously many games we have not yet seen – there may be some which comform to our previous examples: If so, apologies to the companies concerned for generalising. But are we overstating our case?

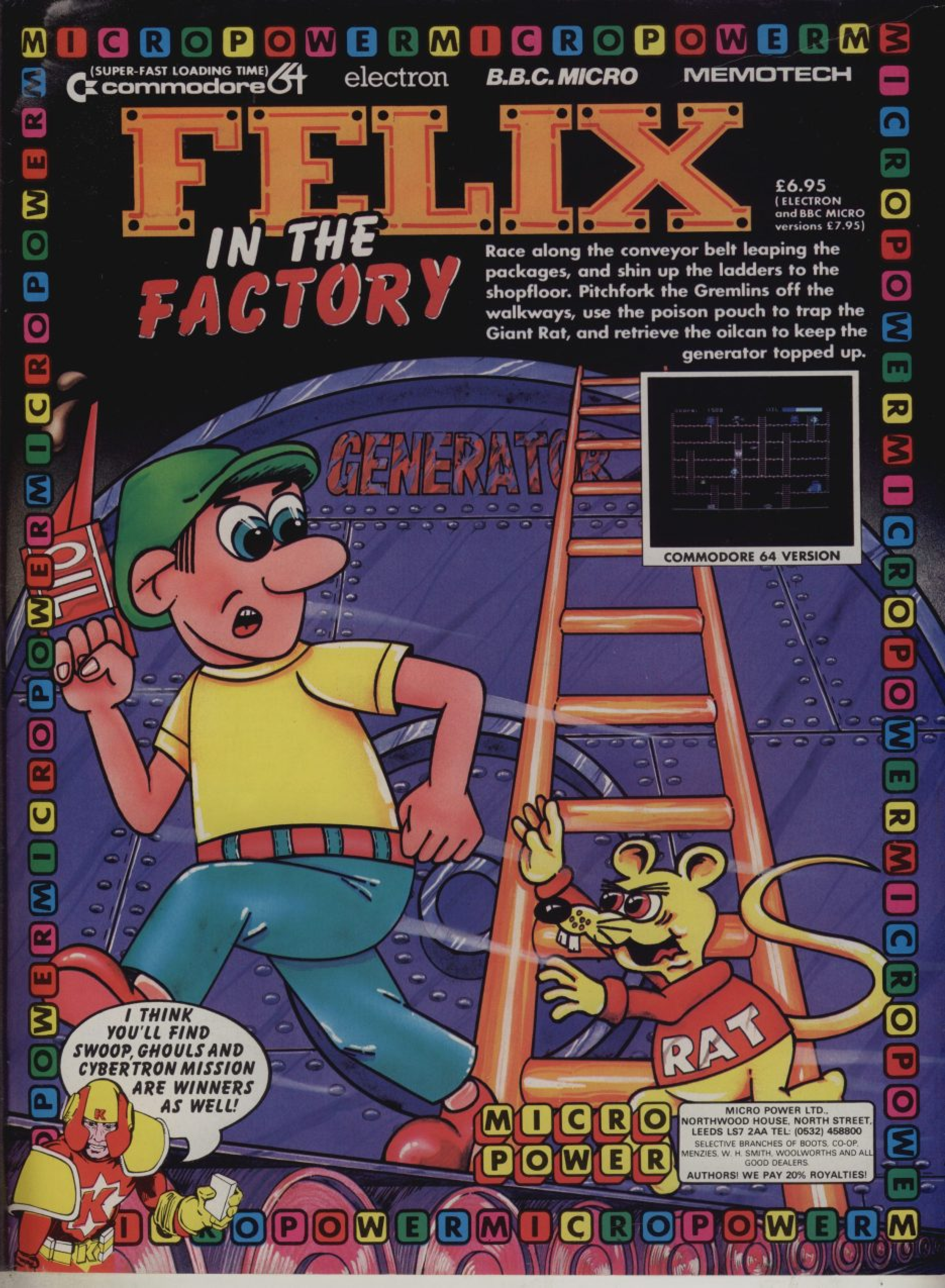
A.C. Jackson, 6 Tudor Road, Brompton Court, Portishead, Avon BS20 9UR

There's probably a great deal of truth in what you say about the general quality of games. That problem is often compounded by a dire lack of originality. We're lucky; we don't have to pay for the games we see. Actually throwing away money on bad games is something we don't experience. Do other readers have gripes about their own bad buys?

More slips with disks

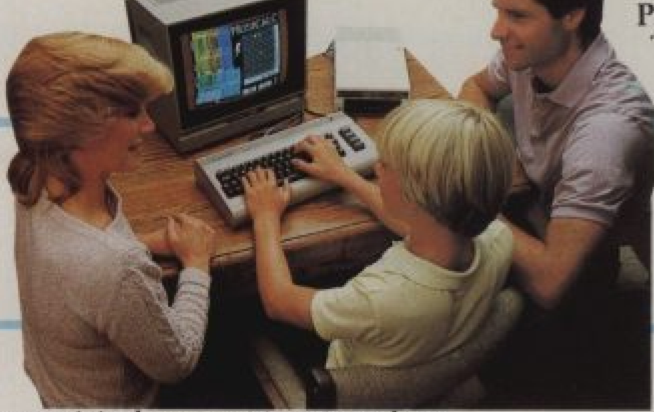
The letter from D.J. Morgan, in your July issue, filled me with hope. Here (I thought) is the answer to the "disappearing document" mystery which has plagued me for nearly a year!

But though I had managed to



MICROPOWERMICROPOWERM
(SUPER-FAST LOADING TIME) commodore 64
electron
B.B.C. MICRO
MEMOTECH
FELIX
IN THE FACTORY
£6.95 (ELECTRON and BBC MICRO versions £7.95)
Race along the conveyor belt leaping the packages, and shin up the ladders to the shopfloor. Pitchfork the Gremlins off the walkways, use the poison pouch to trap the Giant Rat, and retrieve the oilcan to keep the generator topped up.
COMMODORE 64 VERSION
GENERATOR
OIL
RAT
I THINK YOU'LL FIND SWOOP, GHOULS AND CYBERTRON MISSION ARE WINNERS AS WELL!
MICRO POWER
MICRO POWER LTD., NORTHWOOD HOUSE, NORTH STREET, LEEDS LS7 2AA TEL: (0532) 458800
SELECTIVE BRANCHES OF BOOTS, CO-OP, MENZIES, W. H. SMITH, WOOLWORTHS AND ALL GOOD DEALERS.
AUTHORS! WE PAY 20% ROYALTIES!

MUSICALC 2, ScoreWriter™ Works with the Synthesizer & Sequencer to change your musical improvisations into musical notation. With the addition of an optional graphics printer you can turn your



own original compositions into sheet music. Requires MusiCalc 1 to operate.

MUSICALC 3, Keyboard Maker™ Enables you to create your own custom musical keyboards. Comes with over 30 preset keyboard scales from around the world—everything from classical to rock. Requires MusiCalc 1 to operate.

MUSICALC TEMPLATE 1, African and Latin Rhythms Add this to the MusiCalc 1 system and it provides additional musical scores and patches you can play along with or use to develop your own compositions. Requires MusiCalc 1 to operate.

MUSICALC TEMPLATE 2, New Wave and Rock Works like Template 1 and features the latest Technopop scores and sounds. Requires MusiCalc 1 to operate.

MUSICALC PROFESSIONAL SYSTEM The MusiCalc Synthesizer & Sequencer, ScoreWriter, and Keyboard Maker, plus the two Templates, in one cost-saving package.

HIT DISKS Recordings to play on your computer. Original Technopop compositions, current hits and old standards performed by the Waveform Band. Ask your dealer about current releases.

COLORTONE KEYBOARD AND MUSICALC 4 A totally new concept in keyboards, ideal for everyone from novice to professional. A professional quality keyboard that's remarkably easy to learn how to use. The keyboard comes with special software that allows it to work with MusiCalc 1 and 2, enabling you to play music on the keyboard and record it on disk to play back or print out later. Add MusiCalc 4 and play any scale in any key, for even greater musical capability. **Available soon.**

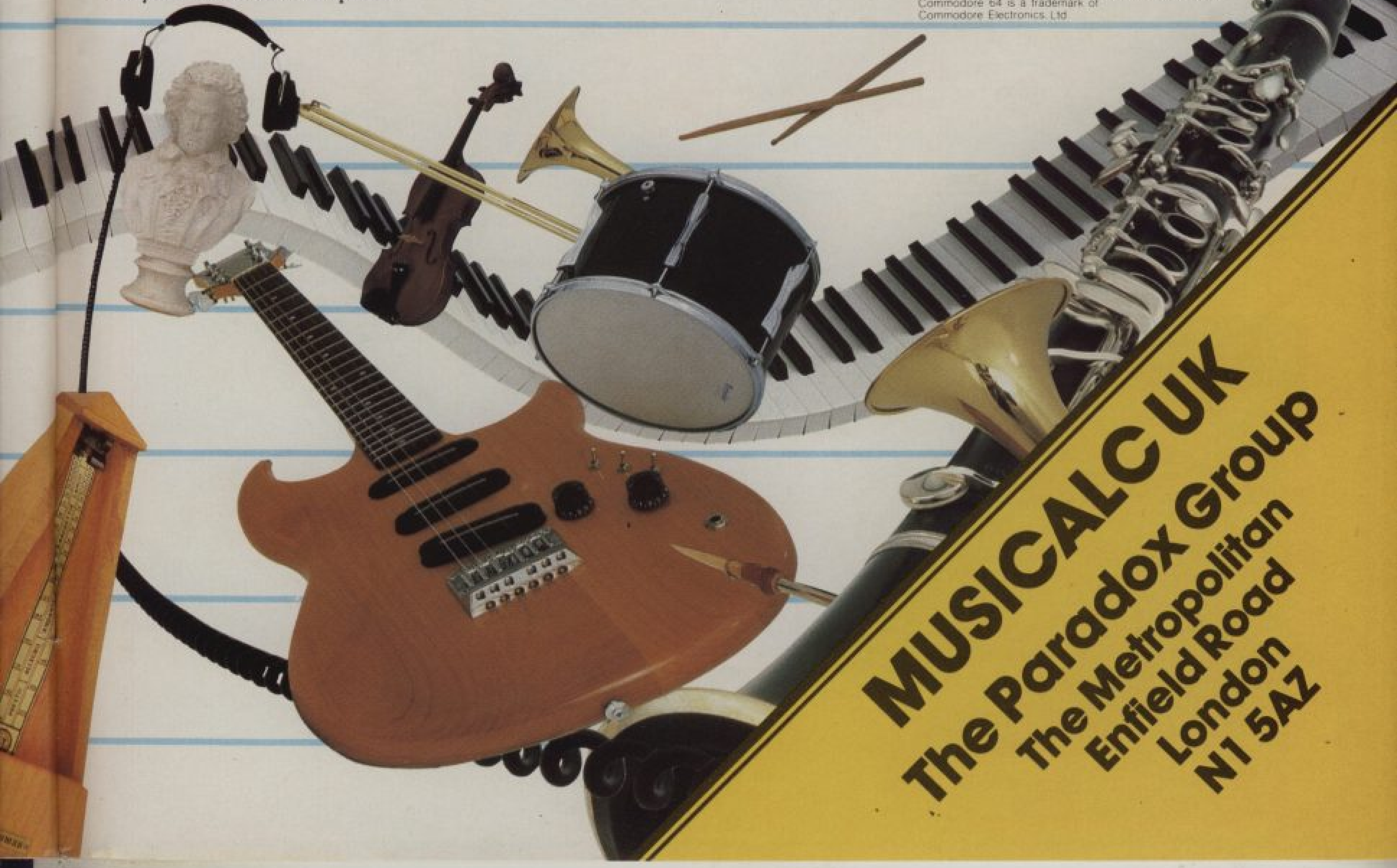
DEMO DISK An entertaining and informative demonstration of the capabilities, features and uses of the entire MusiCalc System. Also available in tape cassette.

MAKE MUSIC PLAY

MusiCalc will make music come alive for the entire family. It's a fun and educational way to introduce your children to music and computers. And no matter what your background, you'll find yourself playing and understanding music in an exciting new way.

Ask your computer or music dealer about MusiCalc. Or send in the attached coupon and $5 for the MusiCalc Demo Disk or cassette. Discover MusiCalc, the creative music system.

waveform
CORPORATION
MUSIC PRODUCTS DIVISION
MAKING MUSIC PLAY



Single-line Competition

April and July one-liner winners

With two batches of entries to contend with, our keyboard prodders looked like having a good time. Alas, their eager anticipation was dashed by too many psychedelic screens, hardly legible writing, programs that just wouldn't run and a general lack of real imagination.

So we we've restricted the Honours List to three for each month. Sweatshirts are already winging their way to the chosen few.

Remember, you may have to use abbreviations for Basic keywords to squeeze the listings into the required one-line length.

April

Andre Gibbs of Barbados, West Indies

```
1 INPUT"CHARACTER";C$:PRINT"■"C$:PRINT"POKE:"PEEK(1024):PRINT"CHR$:"ASC(C$)
```

– just the job for finding out what those CHR$ and POKE codes are

Albert Plattner of County Waterford

```
1 FORX=32768TO33272STEP8:FORY=0TO7:POKE-25600+X+7-Y,PEEK(X+Y):NEXTY,X:POKE36869,
255
```

– this one really got us turning our heads

B. Davis of London

```
1 INPUTD:FORL=3TO0STEP-1:P=16↑L:H%=D/P:D=D-H%*P:PRINTCHR$(H%+48+(7AND(H%>9)));:N
EXT:PRINT:GOTO1
```

– solves your decimal to hex conversion problems

July

Jyrki Holopainen of Virkkala, Sweden

```
1 A=53280:GETA$:B=A$="■":D=A$="■":C=C-B:E=E-D:POKEA,CAND15:POKEA+1,EAND15:GOTO1
```

– make use of your Function keys (press F1 and F3 to get the two graphics characters)

Simon Veryard of Chiddingford, Surrey

```
1 FORT=128TO254:FORI=36874TO36879:POKEI,T:NEXTI:POKE36865,T-100:NEXTT
```

–best of the screen displays we saw

Andrew Hannay of Cardiff

```
1 PRINT"■":POKE36879,5:FORN=1TO9E37:K=PEEK(197):POKE7933+X,160:X=X+(K=8)-(K=0)+(
(K=1)-(K=9))*22:NEXT
```

– a one-line drawing program? Not quite, but it's good fun. Use '←' to go left, '1' for right, '3' for up and 'w' for down.

keep clear of this sort of accident for a month or two, it happened again last night. This was the sequence:

- I finished a longish document ("A") and saved it to disk to replace a shorter version of the same document.
- I then loaded from disk another short "document" which simply gives my own address.
- I next performed the Vizawrite command for changing the name of that document to "B", and proceeded to write a letter, subsequently printing it and then saving "B" to disk under the name "B".
- I then tried to load "A" but "B" appeared on the screen.
- I tried to load "B" and "B" appeared on the screen.
- Fortunately I had taken a back-up copy of "A" on another disk, so I loaded this disk into my CBM 64, changed that disk for another one from which "A" had vanished, and saved "A" to that disk. Now when I try to load "A" from that disk I get "A"; when I tried to load "B" I get "B".

All is now well, therefore. But it would not have been if I had failed to take a back-up copy. As "B" is much shorter than "A", this case does not accord with the one Mr Morgan mentions.

What, then, is the answer? The only one which has occured to me is to use a new disk for each document: then, when you save the amended, and perhaps expanded, version of your masterpiece there is nothing else on the disk for it to overwrite. I appreciate that this is an expensive way of coping with the problem. But if you keep hard copies there usually comes a time when you can scratch each document, so that you have a new disk again.

Does anyone have a better answer? It took me a long time to satisfy myself that overwriting was the cause of all the trouble. I thought when I read Mr Morgan's letter that we had now been given the missing clue... that the overwriting happened when one replaced an existing document with an expanded version bearing the same name. But as my recent experience shows, it can happen somehow that you overwrite an existing document when you are saving an entirely new document, under a new name.

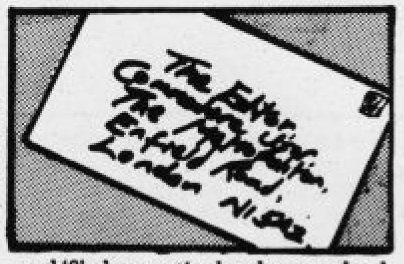
I suppose that by some quirk the document may get itself into two places on the disk at once... in its own slot, so, to speak, and also in the slot of the document which it accidentally overwrites. Any ideas?

Peter McDonald, 254 Leigh Road, Worsley, Manchester.

Delving into Easyscript

In reference to the letter from Mr R.C. Medford in the July issue regarding hidden musical talents of EasyScript, this was no doubt laid by the perpetrator waiting for somebody to find it as Mr Medford has done. CTRL and pound sign produces the same result of playing Land of Hope and Glory.

Now, encouraged by the musical effects I tried other combinations and obtained some interesting results. It would take too long to type them all out, but in edit mode, '3'



and '£' change the background colours very fast. CTRL and 'g' produce a pattern of '<' by default, otherwise filling the screen with alternate g's and spaces, others produce scrolling, double speed cursor ('b' and 's' do this) while M deletes all below and puts a reversed '<' sign in every row column 1. Fortunately none produce the Star Spangled Banner! Those worth trying with CTRL, in keyboard order, are: q, e, t, a, s, d, f, g, =, m, and csr left/right. Others produce results, but less spectacular. Can any use be made of this talent I wonder? At the same time I wish somebody would tell me how to get the 64 to talk to the Brother HR15 other than by EasyScript! I can get no back-up from the firm who sold me the printer I wanted(!). It would be superb if I could persuade the 64 to accept it.

D. Oakley, Dryland House, Chilham, Canterbury, Kent.

CLASS

Vic-20 Word Processor. Victext. Powerful word processor. Facilities include:- Large text buffer, auto centre text, variable tab, insert, amend, delete, copy, move text, word count, right justify, etc. Fully menu driven with comprehensive easy-to-use instructions. Needs +16K expansion min. Great value: cassette £6.95, disk £9.45.

Vic-20 Data File. Takes the place of any card index. Facilities include: save, load file, full sort, print all/part records, amend, delete records, memory remaining, etc. Needs +8K expansion min. Cassette £4.50. program can be used with all direct connect Vic printers inc 1520 printer plotter. Fast delivery by first class mail. Send cheque/PO to: A&C Software, 51 Ashtree Road, Tividale, W Midlands B69 2HD.

Program listings £1.10. Send tape or disk. Radar, Rat Race, Music Composer, Lazarian, cartridges £7.00 each. Software swap includes Zaxxon, Pole Position. Marcus Reddy, 80 Watergate Road, Newport, Isle of Wight.

At £100.00 plus accessories, cassette recorder, Quick-Shot joystick, 5 games, Arcadia, Race, Hoppit, Blitz, and one Space Invaders cartridge. Tel: 612399. C MCHugh 64a Town Park, Belfast 11.

Wanted CBM64 software, games, educational. Swap, sell, exchange, also swap ideas etc. Phone: 051 423 5493 after 6.00pm.

Wanted penpal age 13-15. Must own Commodore 64. Reply by program on tape to: Pete, 12 Hallwood Road, Chorley PR7 2LZ.

Penpal wanted aged between 15-17 and must be female, also must have a CBM64. Any overseas females welcome. If interested contact Anthony Ford, 61 Jessel Drive, Loughton, Essex IG10 2ET, England. All letters received will receive a reply.

CBM64 software, Ultisynth64 £10, Grand Master Chess £11, Mastercode Assembler £10, Arcadia64 £4, Gridrunner £4, A.M. Camels £4, Cyclons £3, Disco £6. P Redgewell, 10 Windhill, Welwyn Garden City, Herts. Phone 34637.

1520 printer plotter (boxed) 3 months old for sale, £80.00 ovno. Write: David Flint, 10 New Market Street, Buxton, Derbyshire.

Half price Vic-20 plus 16K, C2N, Pointmaster joystick, £80. Software: Boss, Jetpac, Bonzo, etc. original packaging and plastic computer and C2N box. Worth £350. Offers £175! Tel: 0332 798865 after 5.00pm ono.

Vic-20 for sale plus C2N recorder, Super Expander, Introduction to Basic PtI, Quickshot joystick, game cartridge, over £60 worth of software and dustcovers. All for £190 only. Ring: 021 554 6493 after 4pm.

Vic-20 cartridges The Count and Pirate Cove, will swap for Adventure Land and Voodoo Castle. R Jane, 11 Oxford Street, Deneside, Seatham, Co Durham. Phone Seaham 813676.

Commodore 64 software to sell or swap. Titles include: Flight Simulator II, Zaxxon, Manic Miner, and many others. Write: A Gerard, PO Box 116, Liege X, Belgium. (All letters answered).

Wanted Softswitch cartridge copier for Vic-20. Original price and all your p&p paid. Write to Gerard Harrington, 141 Saint Brendans Road, Farranree, Cork, Ireland.

Vic-20 Computer £55, 101 programs: 11 top titles, 70 games, 20 educational £15. Super Expander £12, cassette unit £20, joystick £3, 4 books £5. Have original boxes. Sell altogether £100. Tel: 01-452 5940 (Peter).

Printer for 64. MPS 801 dot matrix printer 5 months old, hardly used, £150, still boxed. Phone Paul, Uckfield 4296.

Wanted CBM64 and 1541 disk drive. John Robertson, 1 Old Edinburgh Road, Inverness IV2 3HF.

Help! Does any one know the four clues to the action game in "Four Gates to Freedom", let me know before I go mad! Ring Keith 0203 319687 evenings.

Swap 3 Vic-20 cartridges, Radar, Ratrace, Jupiter Lander, Sargon II Chess for Vic 3K RAM pack

1515 printer – nearly new, perfect condition, with nearly 2000 sheets paper, £135. Also for sale – Arfon Expansion chassis, Programmer's Reference Guide. Phone for more details: Bromsgrove (0527) 76815 (nr Birmingham).

CP/M package for CBM64. Includes Z80 cartridge, CP/M disk and manual. Hardly used, as new. Will sell for only £30. Contact Gavin, 01-954 4548.

A 16K RAM pack for Vic-20. Unwanted gift, £20. Telephone: Leatherhead 375801 evenings.

Exchange or swap Chinese Juggler tape suitable for CBM64 (joystick required). Contact David Sayers, 7 Alandale Park, Eglington, Londonderry, N Ireland. Tel: 0504 810768.

Wanted 2031 or 3040 or 4040 disk unit with or without cables to suit 3032 CBM and Dolphin BD80. Ring 359 6376. Carlstedt, 36 Beechglade, Birmingham B20 1LA. Will collect.

Vic-20 and CBM64 listing service. Vic-20 (16K) only £1.00 and sae. CBM64 £1.20 and sae. Please send cassette sae to John Walker, 14 Leamside, Leam Lane, Estate, Gateshead, Tyne and Wear NE10 8NT. Fast return of cassette and printed listing whenever possible by return of post.

1541 disk drive and 1701 monitor wanted for Vic-20 in good condition, reasonably priced. Telephone: Tetford 739 after 8pm

Swap Attack of Mutant Camels for Falcon Patrol and swap Lazarian on cartridge plus BMX RAcers for The Hobbit. Jordan McClements, 19 Newcastle Road, Portaferry, Co Down, N Ireland. (02477) 71888.

Vic-20 plus C2N £35 of games (including Arcadia, Gridrunner, Voodoo Castle) plus Programmer's Reference Guide plus manual etc. plus £15 of Vic magazines and dust cover and books. £99. Telephone before August 18th (021) 554 8780.

Vic-20 Software Hire
No membership fee! Quality titles (eg Skyhawk, jetpac, Flight 015) from 50p per week. Already 500 delighted members. Join them now. All games originals. Send 2 x 16p stamps for your Hirekit to:
VSH(CU), 242 Ransom Road, Mapperley, Nottingham.

Ace game Quasimodo. Guide Quasimodo over 15 defferent screens to rescue Esmerelda from Count D'arcy. Price is £5.00. The game is for 8K Vic-20. Phone 556 1485 after 4.30pm and ask for Chris.

Searching for a computer fan for exchanging programs with computer fan in Germany. Write to: Frank Lindemann, Grüningsweg 128, 4600 Dortmund-13, West Germany. Tel: 01049/231/212011. (Only Commodore programs).

Commodore 64: wanted: English software to exchange for American. Disks only please. Send for list (300+ to choose from), to Martin Duffy, 3731 Park Ave, Wantagh, New York, USA. Please send list of your progs.

Programs-exchange: CBM64 disk. Have over 1200 programs, will send complete list in return for yours, if extensive! Øivind Amlien, Finstadrabben 97, N-1475 Finstadjordet, Norway.

Australian C64 owner would like to hear from English/European owners, exchange ideas, listings, programs whatever. Also have Australian marketing contacts for your own programs. Post Box 308, Willetton 6155, Western Australia.

More C64 programs! 15 year old boy wants to swap programs. Anyone, anywhere in the world. Send me your list: Michael de Broglio, 17 Ridge Road, Hillcrest, 3610, Natal, South Africa.

64 Edit File utility program. A must for anyone using or wishing to use sequential files. Program creates, adds, subtracts, amends, sorts, prints and saves/recalls to disk or tape. Send £3 with disk or tape. J Aitken, 43 Braedale Ave, Motherwell. Returned by next post.

Commodore business computer system, 8000 series comprising 1 96K computer, 1 dual disk drive, 1 matrix printer. Was new end July 1983: offers invited, contact 061-477 4020.

Games galore for the Commodore 64. Ice Cream: run a fleet of ice cream vans for a week and make as much profit as possible, £6.50. Yahtzee: a computer version of that classic game, £6.50. For full catalogue send a sae or cheques/POs to: Michael Smith, Edenderry Lodge, Banbridge, Co Down, Ireland BT32 3BS.

Vic-20 users wanted for swaps and regular contact between England and Australia, help purchase of software not available in opposite countries. Contact Ron Jarvis, PO Box 198, Engadine, Australia.

SIFIED

Machine Code programs to swap. Send yours on cassette, I'll send mine. I'll accept Basic programs. J Y Sireau, 18 Chemin Du Clos Saint Martin, L'Etang La Ville, 78620, Yuelines, France.

CBM64: I would like to exchange my software (I have more than 800 programs). Please send your lists to: Fernando Forner, Via Valperga Caluso, 21 10125 Torino, Italy.

UCLA student seeks C64 programs and info, as well as international correspondence – all letters answered, whether computer related or not. Write to Tony Freeman, 4323 Lowell Ave, Glendale, California 91214, USA.

Six fantastic games for the Vic-20 unexpanded Mission Attack, Cosmic Cars, Galaxian, Dodge, Race Track, Alien Revenge, Graphic Aid. Send £4.50 to Paul Drake, 8 Cadnam Close, nr Basingstoke Hants.

Vic-20 starter pack with 16K RAM pack, joystick, over 100 games and about 25 computer magazines. Only £150. Paul Deakin, 65 Balcarres Road, Aspull, nr Wigan, Lancs.

Vic-20 girl penpal wanted. Must be aged between 13-15, but does not need much experience or programming. If interested please write to: Michael Lenihan, 109 Clive Road, Fratton, Portsmouth, Hants.

Vic-20 plus C2N, 16K RAM, Super Expander, motherboard, 4 slot switchable, all boxed as new Much software:. Krazy Kong, Pharoah's Tomb, Jet Pack, Games and Utilities, only £175.00 Will split items. Northwich 782475.

Commodore 1520 printer plotter only three months old £75 ono. Steve Knight, 257 Byron Road, Harrow Weald, Harrow, Middx. 427 5735.

Vic-20 Computer (brand new) plus switchable 16K RAM pack, Gorf cartridge, Jetpac, Arcadia, Tornado, Gridrunner, four game cassettes, two issues Victape. Will split. Offers please to: Stuart, phone Newmarket 663276.

Poker, the classic gambling game. Offered to Vic-20 (16K RAM) owners for only £7.95 p&p free. From PO Box 1, Chatteris, Cambs PE16 6JR.

Commodore 64 software. All originals, cost over £50. Nine games including Beach Head, Slurpy, Odyssey, Sooper Froot, Cyclons, Monster Munch, etc. Wants to swap for Speech Synthesiser. Phone (0752) 334419.

Graphix 64: over twenty commands enables you to plot/erase points, draw lines and fill/erase areas on screen (as advertised in Vicsoft magazine). Used only twice. Bargain at £8.50. Tim Bak, 117 Kingsway, Braunstone, Leicester LE3 2PL.

Commodore 64, C2N cassette unit only £200. Unwanted gift. Free joystick. Phone Amar (01) 574 8583 or (01) 571 3051. Also 1525 printer £200 plus printer paper and labels. And free Wordwizard program.

Extended for Basic for Vic-20 with at least 8K expansion only £5.50. Adds 23 commands and 2 functions utilising sound, colour and graphics (160 x 192). Supports user defined, double height characters. Includes free demonstration programs. Send cheques/POs to: D Redmond, 12 Durham Street, Garston, Liverpool L19 8LJ, Merseyside.

CBM64 computer C2N cassette unit, 1541 disk drive, 1520 printer plotter and 1525 graphic printer for sale. All leads, manuals, etc. included. Less than two months old, in original boxes, offers please. Box 014.

Bored with your CBM64 software? Then why not exchange it for only 75p. Send sae for details to: Humphrey Software, 49 Underdale Road, Shrewsbury, Shropshire.

64 Turbos, send me your originals and I will make Turbo copies on other side (including Anirog Turbos). Will load faster than disk. £2 per tape. Money and tape returned if unable to make Turbo. Tapes to W Atkinson, 64 Church Road, Haydock, St Helens, Merseyside.

Soloutions to Scott Adams adventures, £1. Send money with your address to: martin Wright, Alma, Cilcinnin, Lampeter, Dyfed, Wales SA48 8RH. Please indicate solution required. Tel: 0570 470362.

Two fishing rods 6ft plus tackle plus box. Swap for 3 games tapes or two cartridges for any Vic-20. Telephone 97-39223 after 5pm.

1541 disk drive in good working condition with manual, for Commodore 64. Contact Jim, 0389 67431 or 26 Dumbuck Road, Dumbarton G82 3AA.

Wanted: Modem software for CBM64 with Minor Miracles WS2000 Modem compatible with following standards CCITT V21,V23 and American Bell 103/113/108 and bell 202. Ring 01-337 3183 evenings and weekends.

Penpal wanted for Vic-20 user to exchange listings and and information. Please write to Barsneb Farm, Markington, Harrogate HG3 3PJ, thank you. PS: name is Raymond Peacock.

Hire purchase CBM64, Disk Drive, etc. Assume payments, sae to James Corsbie, c/o London Mail Link, 26 Ascott Ave, Ealing, London W5 5QB.

Commodore 64 plus C2N, cassette games. Still under guarantee. £200. Arthur Smith, 3 Bellfield Road, Mastrick, Aberdeen AB2 6QB. Tel: 0224 692158.

Vic-20 data file: facilities included. 8K RAM expansion, disk: £10.00 (send your own disk for faster delivery) or £12.00 if no disk is sent. Cyril Aubry, 6 rue Chancenotte, 2100 Dijon, France.

Turbo tape, Load, Save, Verify programs. 10 times faster than disk, only £7.50. P Argyle, 18 Balston Road, Poole, Dorset.

Mint condition boxed 32K Vic-20 plus 10 games £125. Super Exp £20. Viction £22. Motherboard 4 slot switchable £20, or bargain £152 the lot, plus Vic Computing etc magazines. I also have Grand Master Chess for the Vic, £10 ono. Telephone: Alun on Brighton 420798.

Easyscript (disk) never used £35.00 ono. Contact: Mr S Armstrong, 32 Gloucester St, New Hartley Whitley Bay, Tyne and Wear NE25 0RH.

Popular games chart being compiled for CBM64, BBC, Dragon, Spectrum. Send your favourite top 20 stating micro to: Thirlmere, Hookhills Road, Paignton, Devon TQ4 7NH. Elclose stamped addressed envelope for completed chart.

64 books and games wanted for new club. Write: Chris Bradley, 31 Checketts Lane, Worcester.

CHYME SOFTWARE

require educational, arcade or adventure programs already written or to be created, of a marketable quality from Ireland or England.

Apply to:
Chyme Software
John F Kennedy Drive
Naas Road
Dublin 12
Ireland

Commodore 64 daisywheel listings, Easyscript prints etc. Tape or disk, ring or write for quote: 01-360 2156 or Mark Wilson, 185 Prince George Ave, Southgate, London N14 4TD.

Vic-20 plus cassette recorder, quickshot joystick, games inc Arcadia, Chopper, Crawler, Gorf, Radar, Rat Race, mags, £110 ono. Tel: 061 7478101. Ridings, 5 Entwistle Ave, Davyhulme M31 3TN.

CBM64, 1541 drive, 1701 col monitor, 1520 printer plotter, Highflyer (diskgam), Home Manager (disk) plus four blank disks plus 14 cassette games including Utisynth plus Datasette plus joystick plus manuals (REF) plus (Mac code) plus (Dbase) £720. Ian Morgan, 16 Carlton Close, Danesmoor, Chesterfield, Derbyshire S45 9RP (0246) 863693.

Vic – send C60 cassette and five pound postal order for twelve programs including Octacker, Numbervader, Pussy, Bandit. All original. Discount for forces. Les carton, 5 Hamilton Drive, Market Lavington, Wilts SN10 4BN.

Vic – send C60 cassette and five pound postal order for twelve programs including Octacker, Numbervader, Pussy, Bandit. All original. Discount for forces. Les Carton, 5 Hamilton Drive, Market Lavington, Wilts SN10 4BN.

N. Ireland Vic-20 Starterpack. Five months old, lots of software including Wacky Waiters £150 ono. Eamonn O'Kane, 22 Beechmount Park, Randalstown, Antrim, N Ireland. Randalstown 73120.

Vic-20 software for sale. Over 80 titles including compiler, 40 column conversion tape. All tapes £3.50. Send for list to: Marpaulyn, Woodham Rise, Woking, Surrey or phone: 04862 67693.

COMMODORE user

Ad – Index

Commodore User is published twelve times a year by Paradox Group Limited, The Metropolitan, Enfield Road, London N1 5AZ.
Subscriptions and back issues are handled by B.K.T. Subscription Services, Dowgate Works, Douglas Road, Tonbridge, Kent TN9 2TS; Telephone 0732-351216
Annual subscription (UK) £12.00, (Eire) £IRL 17.00, (Europe) £18.00, (Rest of the World) £32.00

Cheques and postal orders should be made available to

COMMODORE USER LTD.

Printed by Garrod & Lofthouse Ltd, Crawley; Photosetting by PDQ, London N10, telephone 01 444 0359; Reproduction by Elan Litho Ltd, London EC2. Distributed by Associated Newspapers.

Material is accepted on an 'all rights' basis unless otherwise agreed. Enclose SAE if you want the return of original manuscripts and photographs.

ISSN 0265-721X

CBM64, disk drive, Star DP510 printer, printer interface, DTL64 Basic Compiler, Simons' Basic, cassette recorder, 20 plus games, £500. S Butler, "Sparrows", Larks Lane, Gt Waltham, Chelmsford, Essex CM3 1AD. Chemlsford (0245) 360586.

Vic-20 plus C2N cassette unit with £140 of games inc cartridges, Jelly Monsters, Star Battle, Pirates Cove plus various tapes. Offers £120 ono. Ring after 4.00pm, Simon Cathcart 01-670 0863.

Vic-20 listings max 16K. Send cheque/PO for £1.50 payable to P.R. Webster to Listings, 16 Lympsham Green, Odd Down, Bath BA2 2UL. Including cassette of program to be listed (cassettes returned).

Jelly Monster cartridge for Vic-20 wanted. Ring Brown (0493) 76785 or write Rivendel, The Holway, Winterton-on-Sea, Norfolk NR29 4BW.

If you have any Vic-20 software you want to sell then contact James Watson, 6 Redwood Glen, Chapeltown, nr Sheffield S30 4EA. The max offer is £5 for tapes, £7.50 for used cartridges. Also if you have any old computing mags send them to my address, max price £1.50.

Hey! have you got a Commodore 64 to sell for a reasonable price? If so contact me at: 31 Parkhurst Road, London N11 3EN or call 01-368 7270 between 4.30 – 8.30 Monday to Friday.

Wanted: for CBM700, Superscript II. Also Superbase and CalcResult. Please contact: Lionel Tun, Elm Lodge, Cricket Green, Mitcham, Surrey CR4 4LB.

PET 2001-8 (with Diskmon DOS) software required, especially business/accounts programs. Chapman, 23 Banbury Court, Kidlington, Oxford. Telephone: Kidlington 77073.

Wanted: educational software for nine year old boy with CBM64. Would appreciate opinion on what is most interesting/stimulating/boring. Rendall, 10 Testcombe Road, Alverstoke, Gosport, Hants PO12 2EL.

Commodore 64 software to swap, many American games, disks and cassettes. Please write to: T Vanes, 23 Millers Vale, Poolhouse Farm, Wombourne, West Midlands or ring Wolverhampton (0902) 896678.

Wanted: Compute!'s First Book of Vic, 1982. Will purchase or swap. Contact Dean on Stevenage (0438) 811634 or write 17 Hampton Close, Stevenage, herts.

Wanted: Renaissance, Tank Commander, Medieval Joust, Mineral Miner cartridges for Vic-20. Tel: Stevenage 811634 or write 17 Hampton Close, Stevenage, Herts. Willing to swap.

Wanted: CBM64 software. Manic Miner, Hunchback, etc. Will offer good price. Mark, 62 Little Breach, Chichester, West Sussex PO19 4TY.

Good games on cassette for the CBM64. I will swap or sell games like Soccer, Chess, Pac-Man, Rat Race, Crazy Kong, many more. Write to Zeno Winkens, Lake House, Curracloe, Co Wexford, IRL.

Swap Vic-20 Gorf cartridge for Pirate Cove. Also swap Jetpac, Matrix, Lazerzone, Intro to Basic Pt 1 for other games. George Ingram, 6R Bucklemaker Court, Dundee, Scotland.

Wanted: Audiogenic's Forth Compute!s First Book of the Vic, Atarisoft's Defender. For sale: Commodore's Avenger £4.50, Imagine's Arcadia £3.50. Swap: Pirate Cove for Mission Impossible. (Phone now) 0558 822509.

Wanted: Super Expander cartridge for Vic-20 computer. Will pay up to £18. Contact: Simon Matthews, 25 Whitehall Road, Didsbury, Manchester M20 0RV, or phone with details on 061-434 1520.

Wanted: pools prediction program for 16K Vic-20. Please give details and price required to: Raymond Neale, 23 Brandon Road, Halesowen, West Midlands B62 9QD.

Wallies ignore this ad. Arfon motherboard for Vic-20 £50. 16K RAMpack £20 Geoff or Ron, 87 Framingham Road, Sale, Ches. 061 973 0967.

Commodore 64 plus £60 of extras £225 ono. Phone: Farnham 723261 after 6pm.

CBM64 software, Hobbit, Blue Moon, Batattack, Egbert and Commodore joystick, £35 or will split or swap for Ultisynth (Quicksilva) and cash. Telephone: 0630 57129 between 1pm-10pm.

CBM64 Snake. Guide Sidney around the screen eating flowers whilst avoiding bricks. A fast moving graphic arcade game. Only £2.75 M&P. Purseglove, 2 Kendal Drive, Tonbridge, Kent TN9 1LZ. Games wanted.

Home Accounts. Put your house in order! An excellent use for your computer! Comprehensive coverage of bank accounts, credit cards, HP., etc. Inbuilt accuracy check. Projects cashflow for any period ahead. For CBM64 and Vic-20. £8.45. Free details Discus Software, Freepost, Windmill Hill, Brixham TQ5 9BR. Tel: 080 45 55532.

Visicalc for Pet series computers in mint condition £80. Tel: C.C. Stone, Hinckley (0455) 615602 evenings only.

Adventures! Swap your Vic-20 Scott Adams adventures for either The Count or Mission Impossible. Write to: David Gardiner, Old Timbers, Frenchmoor, West Tytherley, Wilts. Telephone: Lockerley (0794) 40049.

Commodore 64! A Stack lightpen with 6 tapes, brand new unwanted gift, unwrapped, £25. Also some Commodore games, new at £4.50 each. Jackson, 59 Burgess Avenue, Kingsbury, London NW9. Tel: 01-200 1036.

ONLY £34·95 (p&p £2·50)



THE ROTRONICS DR2301 COMPUTER/ AUDIO CASSETTE RECORDER

The Rotronics DR2301 has all the facilities you would expect of a quality audio recorder and also works perfectly with the VIC 20 and CBM 64 computers without any fiddly separate boxes or adaptors. Simply connect the DR2301 directly with your Commodore computer via the lead supplied and you are ready to start. The built-in interface circuitry ensures that SAVEing and LOADing is completely reliable – even when using commercially produced software. The DR2301 also allows the computer to sense when the PLAY key has been depressed.

Additional features are auto-stop, tape counter, in-built microphone and foldaway carrying handle. The DR2301 is also compatible with the ZX81, Spectrum and many other popular home computers.

The DR2301 will take its power from the computer (Commodore only), mains adaptor (supplied) or internal batteries. Each unit carries a full 12 month guarantee.

Superb accessories for Commodore from Rotronics

THE ROTRONICS PORTABLE CASE

Here is the ideal portable work station for home, school or work. Specially made for most home microcomputers, it contains your VIC 20 or CBM 64 within a smart executive style case with removable lid for convenience in use.

The individually tailored foam insert securely protects your micro and cassette recorder (C2N or DR2301) during transit. Additional storage space in the lid holds manuals and up to twenty cassettes. A scalpel is provided to modify the insert for expansion units and an alternative insert can be supplied if you change your hardware in the future. The case is also available with uncut foam inserts.

All components remain fully operational within the case via inter-connections routed between the double layers of foam, so there are no unsightly leads.

The case has been designed for easy use with each component positioned for convenient operation. The overall dimensions are 138mm x 725mm x 363mm.

ONLY £34·49 (p+p £2·50)





ORDER FORM

Please send (enter as appropriate)

___ Rotronics Computer/Audio Cassette Recorder(s) at £36.95 each (inc. p+p). ______

___ Rotronics Portable Case at £36.99 each (inc. p+p) for VIC 20/CBM 64* with C2N/DR2301* or Uncut Foam ______

Trade Enquiries Welcome
All prices inclusive of VAT TOTAL £ ______

☐ I enclose a cheque/PO* for £ ______ made payable to SMT

☐ Debit my Access/Barclaycard* account no.

(*delete as applicable)

Signature ______

Name ______

Address ______

Send to (no stamp required):
SMT, FREEPOST, Greens Norton, Towcester, Northants, NN12 8BR

Please allow 28 days for delivery.

VISA Access

SMT